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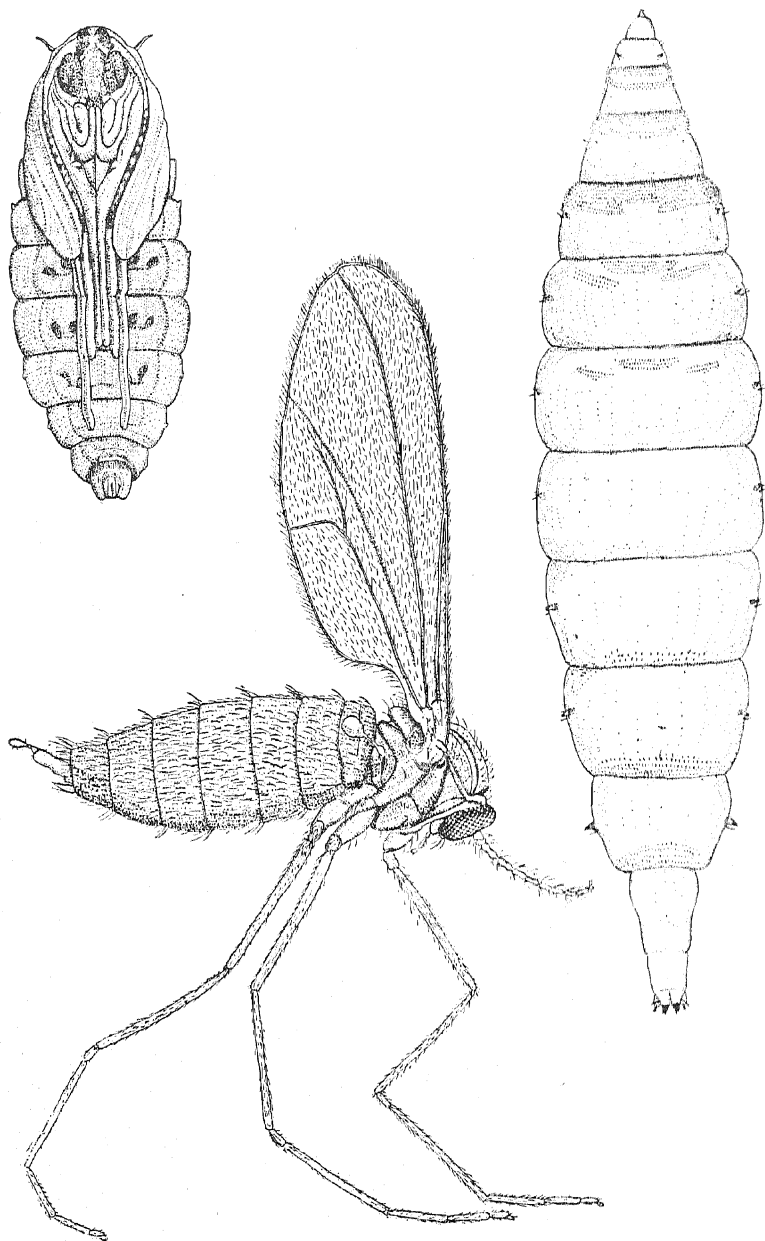
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# ENTOMOLOGICAL NEWS

AND

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## The Monterey Pine Resin Midge—*Cecidomyia resinicoloides* n. sp.

By FRANCIS X. WILLIAMS.

(Plate I)

This paper was written in the Entomological laboratory of Stanford University, and represents the biological\* results of nearly a year's study of a new species of *Cecidomyia*, whose larva inhabits the resinous exudations of the Monterey pine (*P. radiata*) growing about the University.†

As little study has been made of pitch-inhabiting midges, living as they do under such peculiar conditions, the writer has endeavored to clear up as far as possible some of those points in the life-history of this insect, which in other species were doubtful or not fully brought out.

Our only described species of *Cecidomyia* comparable to the Monterey pine resin midge in general habits is *C. (Diplosis) resinicola* O. S. (9). Brief notes are given on the habits of the same. Comstock in his report for 1879 (2) gives a some-

\* The anatomy which has been worked out by me is reserved for another paper.

† Later (June, 1908) I observed this insect in small numbers in the Monterey pine forests at Carmel, Monterey Co., Cal.

what longer account of its life-history, and Eckel (3) gives it still more in detail.

Felt (5) in an article on this species compiles largely from the last writer. Aside from a few notes by other writers, this is the extent of the literature relating to his eastern midge.

The Californian species recently found inhabiting the resinous exudations of the Monterey pine is somewhat larger than its eastern cogener, and differs from it in other respects, both in the larval and imaginal stage. I place this new species in the genus *Cecidomyia*, adopting the generic distribution of Kertész, which Aldrich uses in his "Catalogue of North American Diptera" (1905).

***Cecidomyia resinicoloides* n. sp.**

Male. Length of body 4 mm., alar expanse 9-10 mm. Antennæ 2 plus 24 jointed, not much shorter than body, of dark color except scapus, which has grayish-red tinge; flagellum with small subglobular joints alternating with double subcylindrical ones; pedicels between the joints about equal to the diameter of the shorter joints, somewhat longer towards the end of the antennæ; joints verticillate, the length of the hairs of the verticils much longer than the shorter joints, and the longer ones slightly longer than the double joints; end of flagellum recurved dorsally almost into a circle.

Female. Length of body 5.5 mm., alar expanse 11 mm. Antennæ 2 plus 12 jointed, less than half as long as body, joints of flagellum subcylindrical, more than twice as long as broad, the basal ones longest; pedicels short, the hairs clothing the antennæ are slightly shorter than each single joint, with here and there one fully as long. Antennæ slightly upcurved. The black eyes in both sexes confluent above, occupying the whole surface of the head except a space around and below the antennae and a portion of the occiput, which parts are brownish red. Some recurved blackish hairs arising from occiput, also a small bunch on frons below antennae. Ground color of thorax grayish with slight brown or reddish-brown tinge (varying in intensity according to age) with the base of the wings and the sutures reddish, which color predominates generally in freshly emerged specimens, darkest on the dorsum with sparse bristly black hair, a row of which runs along a blackish stripe on each side of the median line of the scutellum, converging slightly posteriorly and then diverging and becoming more obscure. Viewed in another light this line is broken into an anterior and a posterior stripe and a short posterior median band. The light contrasting ground color brings out an apparent yellowish-gray stripe on

either side of the black dash, especially prominent outwardly. The pale hairs viewed against the body appear blackish. Abdomen reddish, somewhat darker on dorsum, in the female covered with coarse grayish or darker hairs with a few longer dorsal and ventral ones on the posterior part of each segment. Hairs proportionally longer and pale in the male, with a few longer dark ones on dorsum and venter as in female. Genitals pale; feet pale brownish, gray at base becoming blackish distally, with pale gray appressed pubescence; some longer and darker hairs on underside of femora. Halteres pale yellowish brown at base, darker reddish brown distally. Wings appearing smoky black owing to the numerous dark hairs covering them, fringes long and grayish; second longitudinal vein arcuate in its latter portion and ending immediately beyond apex. Described from several fresh males and females taken in the Stanford Arboretum, and now in the Stanford University Entomological collection.

Egg—.60 mm. long, elongate rounded at both ends, about three and one half times as long as wide, bright orange.

Mature larva—About 10 mm. long (but capable of much greater extension and contraction), width 2 mm.; fusiform, tapering more gradually caudad, somewhat wider than deep. Color bright orange, the stomach showing as dark brown and the Malpighian tubules as deep orange. 14 segments including the head which is very small, and which together with the supernumerary segment is often partially withdrawn into the following segment; segments 6 and 7 widest, 11 quite slender and appearing compound, 12 small, below 11 and deeply cleft. Breastbone elongate and varying considerably in form, somewhat incised anteriorly. Two large anal spiracles, and lateral ones on segments 1 and 4—10. Long transverse dorsal and ventral patches of short bristles, best developed anteriorly where they point caudad, posterior spines point cephalad. These bristles are no doubt used to assist in locomotion.

Pupa—Length 5 mm.; stout, orange red; thorax and appendages (with the exception of their free ends which are pale translucent with an orange tinge) darker; legs reaching nearly to end of 6th abdominal segment and free beyond the 2nd. A slender, curved yellowish-brown breathing tube behind each eye, with a rough, dusky, pointed cocoon-breaker at the base of each antenna at the angle formed by the vertex and frons. Thorax smooth and shining; abdomen duller and rougher; spiracles reduced.

### LIFE HISTORY.

Owing to the unusually mild spring weather of 1908, *Cecidomyia resinicoloides* was probably on the wing somewhat earlier than usual. The first adult observed was on March

16th, which specimen, however, was bred in the warm laboratory. March 19th a specimen was taken resting on the trunk of a Monterey pine growing in the Stanford Arboretum, and a day later several of the midges emerged indoors. Early in April adults were plentiful, and one female was observed probing about rapidly with her long, slender ovipositor on a hard, dry resin nodule. No eggs were found here, however, but on the same day a few soft, oblong, orange-colored eggs were discovered in a fissure at the base of a rather soft, whitish lump of resin, which harbored a colony of *resinicoloides* pupae. Late in May a short search revealed numerous extruded pupal shells, no adults and but few eggs. No search was made for larvae in summer, but in September, 1907, many well-grown ones, scarcely smaller than mature larvae of spring, were found. It is quite likely that the insect is single-brooded, spending the greater portion of its life in the larval state. As with *C. resinicola* of the Eastern United States, our western resin midge has gregarious habits, the larvae numbering from a very few to more than fifty in the same nodule, which is always soft so long as the insects are feeding. Colonies of *resinicoloides* larvae were most commonly found in masses of pitch which exuded from places where limbs had been sawed off at the trunk, the bark closing around such wounds, frequently forming hollows where much resin accumulated, and thus furnished an ideal place for a colony of these insects. Smaller colonies were found in cracks in the branches filled with resin, and in small resinous globules on twigs. In no case did it seem probable that the larvae were the primary cause of the resinous exudation. Besides occurring on Monterey pine, a small colony of these larvae were discovered in a lump of resin on a *Pinus muricata* (?) growing in the Stanford Arboretum.

Several experiments were made with *resinicoloides* larvae to ascertain if possible whether they could make a prolonged stay completely buried in the resinous mass. Whenever larvae were covered with semi-liquid resin they worked their way to the surface if the resin had not become too hard, and brought

their anal spiracles to the surface of the mass. This was usually done within twenty-four hours, and those larvae, unable to work their way to the surface, eventually perished. Several mounted in Canada balsam lived in that medium for over a week, but their anal spiracles were exposed at the edge of the coverglass. It is evident that the larva must come to the surface for air, though this may be only at long intervals. It was difficult to observe the way in which the larva gets its air supply under natural conditions, owing to the opaqueness of the resin, but investigation showed that the insect always had its anal spiracles towards the surface of the nodule, at times in a hollow in the pitchy mass, and in other cases so deeply submerged in the medium that it seemed doubtful if the insect could extrude its terminal spiracles. A rule apparently quite constant was that soft resin harbored large larvae, while in the harder, often discolored medium these insects were shortened and of a reddish color, as if preparing for pupation. A lump of soft resin if hardened would always stunt the larvae within. These would often pupate, but without forming a cocoon.

Pupation does not occur until spring, and is probably dependent upon temperature. During winter many larvae formed pupal chambers and lay therein as abbreviated reddish prepupae. A note dated January 18th, 1908, states that fresh, soft resin harbored feeding larvae, while hard, crusted resin contained larvae in their pupal chambers, the latter being the more numerous. Another note of January 17th states that many larvae were observed still feeding, and that the shortened ones are to be found in the harder gum, reddened perhaps by excrement.

Before transforming the larva makes a cocoon of thin papery consistency, a good deal longer than the prospective pupa and with one end bulging from the resinous mass as a cap. A number of cocoons may be found in close proximity, so that their walls touch. In such cases they resemble somewhat the miniature comb of a social wasp. Whether the cocoon is spun by the larva was not determined; I am inclined

to believe that it is, since the cocoon is not of the same consistency as the surrounding medium, having a more papery texture. A few strands of silk-like structure are sometimes found about the pupal chambers. It is evident that the resinous cap is formed by the larva pressing the resin outwardly with its anterior part, possibly using the "sternal spatula" for the purpose.

On March 11th the first pupae were found, but there were still a few feeding larvae, the great majority, however, being in pupal chambers. These latter do not pupate immediately (except perhaps the late-maturing ones), but hibernate for some time before transforming. When the insect is near pupation the thoracic segments become differentiated from the following segments by contracting into a smooth cone, the inter-segmental grooves disappearing and the appendages becoming visible under the skin as alternate darker and paler portions, and the two extremities of the forming pupa separate from the enveloping exuvium. The process of shedding this exuvium was not observed; several pupae, however, were examined as they lay in their cells, and the larval skin was found clinging to the last two or three segments; other pupae were found to have the larval skin wholly removed, the spatula and head skeleton remaining with the cast exuvium.

The pupa is quite active, reminding one somewhat of that of a lepidopterous insect. As the midge develops the anterior portion of the pupa darkens, especially about the head, and at the proper time (two or three weeks) is extruded through the cocoon cap and the fly issues from its shell. The adults emerged mostly in April and early May, and were found to be more sluggish than *Cecidomyia* (*D.*) *pini-radiatae*.

A great diversity of habits exists among the various pine midges, and the making synonymous of forms of widely different habits seems to me open to question. *C. resinicola* as we have seen has habits quite similar to *C. resinicoloides*, its western representative, but *C. pini-inopis*, considered synonymous with *resinicola*, attacks the needles of *P. inopis* and pupates in a resinous cocoon on a needle.

*C. pini-radiatae* lives at the base of the needles of Monterey pine, which become stunted and swollen as a result of its attacks, and pupates within the fascicle. This refers to *C. pini-radiatae* about Stanford University, for in Golden Gate Park, in San Francisco, apparently the same species produces no swelling of the pine needles (which, however, turn yellow), while the pupa of the latter is enclosed in a resinous cocoon which is often fastened externally to the scales at the base of the needles. The fact that the Golden Gate Park *C. pini-radiatae* neither stunt nor swell the needles was discovered by SNOW (11). On the European pines are found several species of midges with habits corresponding to those of our North American *Cecidomyiidae*. Much interesting work remains to be done with these insects.

*C. resinicoloides* was found to be singularly free from parasites, as but two examples of a chalcid fly (which is evidently the *Syntasis diplosidis* that preys upon *C. resinicola*) were obtained from the many larvae and pupae reared to maturity.

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#### EXPLANATION OF PLATE I.

Fig. 1.—Adult, ♀.	} all greatly enlarged.
Fig. 2.—Pupa.	
Fig. 3.—Larva	

### Some new Bees of the genus *Coelioxys*.

By T. D. A. COCKERELL.

#### *Coelioxys deani* n. sp.

♂.—Length about 7 mm.; black, with the tegulae dark brown, and the tarsi obscurely more or less brownish; wings with the apical margin broadly dusky; nervures piceous, stigma dull reddish. Vertex dullish, with large irregularly-placed punctures; cheeks with much white hair, and below with a broad shining beveled space; eyes black, their pubescence only moderately long; face covered with white hair; antennæ entirely black; mandibles black; tongue and labial palpi bright ferruginous; mesothorax and scutellum shining, with large close punctures; scutellum with no median projection, its lateral teeth small and curved; anterior border of mesothorax with a practically continuous band of creamy-white scale-like hairs; posterior lateral corner of mesothorax with patches of white hair, and some in scutello-mesothoracic suture; spurs ferruginous; abdomen shining, with strong but well-separated punctures; hind margins of segments 1 to 5 with conspicuous narrow white hair bands; first segment with a weaker band round the edge of the basin; no other bands, but third and fourth segments with a little hair in the transverse depressions; fifth segment strongly toothed at sides sixth produced, and with a deep broad groove above, its teeth number six as usual but the upper apical ones are rudimentary. Among American species readily distinguished by its very small size, and the produced apical segment, which is longer than broad, if the breadth be counted from the *inner* bases of the lateral teeth. The apex of the

fourth ventral segment shows a minute notch. The interval between the apical teeth of abdomen is minutely black-haired. It is evidently related to *C. modesta* Smith, differing in the small size and the color of the legs.

*Hab.*—Boulder, Colorado, July 13, 1908 (*Paul M. Dean*).

***Coelioxys sayi novomexicana* n. subsp.**

♀. Larger, length about 11½ mm.; legs, including the whole of femora and trochanters, bright ferruginous red; tegulae bright red; clypeus strongly notched in the middle.

*Hab.*—Las Cruces, New Mexico, June (*Cockerell*). This is the New Mexico insect hitherto reported as *sayi*; it is at least a good subspecies, perhaps a species. Two specimens are before me, bearing numbers 955 and 167.

***Coelioxys soledadensis* n. sp.**

♂. Length about 10 mm., black, the general surface bare, but *the white markings due to pubescence very conspicuous*. The face is covered with white hair; mesothorax with the white band in front broadly interrupted; a conspicuous but short band in scutello-mesothoracic suture; mesopleura margined with white; first three abdominal segments with broad apical bands, but no hair in the transverse depressions; first segment white at sides, and part way along the edge of the basin; fourth segment with a rather weak band in the basal depression, and the apical band very broadly interrupted in the middle; fifth with a broad basal band, slightly interrupted in the middle, and only minute lateral patches to represent the apical band; sixth with a very broad basal band. Head and thorax strongly and very densely punctured; *clypeus broadly and deeply emarginate in the middle*; eyes sage green, with short hair; flagellum dark ferruginous beneath; scutellum with no median process, the lateral spines long and moderately curved; *tegulae dark rufo-fuscous*; wings reddish, stigma ferruginous, nervures fuscous; *legs reddish-black, the tarsi distinctly reddish; spurs ferruginous*; abdomen rather closely punctured; fifth segment with distinct but short lateral spines; sixth short, with short lateral spines, and four short apical ones, the upper the shortest, the lower broad and subtruncate; apex of fourth ventral segment with two short dentiform projections. Resembles *C. grindeliae* Ckll., but has shorter hair on the eyes, differently shaped apical teeth on the abdomen, &c.

*Hab.*—Soledad Canon, Organ Mts., New Mexico, at flower No. 38, Aug. 15 (*C. H. T. Townsend*). Very likely parasitic on *Megachile soledadensis* Ckll., which was taken on the same day at the same place, though at a different flower. In the banding etc., it closely resembles the *Megachile*.

## A Report on the Species of the Siphonaptera found within the Boundaries of the City and County of San Francisco, Cal.

BY CARROLL FOX Past Assist. Surgeon, U. S. P. H. & M. H. S.

The following species of fleas were observed during the examination of some 17,000 specimens obtained from mammals trapped within the limits of San Francisco. 14,273 specimens were examined from *Mus norvegicus*, 1842 from man and about 1,000 from other small animals, the names of which will be given under the host. The *Pulex irritans* seems to be a constant parasite of the skunk (*Mephitis occidentalis*) as of six specimens of that animal examined the *Pulex irritans* has been found more or less numerous on each one, while no characteristic species of flea has been encountered.

### Genus **PULEX** Linnaeus.

#### **Pulex irritans** Linnaeus.

Hosts:—*Homo sapiens*, *Mus norvegicus*, *Mus rattus*, *Canis familiaris*, *Mephitis occidentalis*.

### Genus **LOEMOPSYLLA** Rothsch.

#### **Loemopsylla cheopsis** Rothsch.

Hosts:—*Mus norvegicus*, *Mus rattus*, *Mus musculus*.

### Genus **CERATOPHYLLUS** Curtis.

#### **Ceratophyllus fasciatus** Bosc.

Hosts:—*Mus norvegicus*, *Mus rattus*, *Mus musculus*. Twice taken from man, twice from *Mephitis occidentalis* and once from *Thomomys bottae*.

#### **Ceratophyllus acutus** Baker.

Host:—*Citellus beecheyi*. Taken once from *Mus norvegicus*.

#### **Ceratophyllus telchium** Rothsch.

Host:—*Microtus californicus*.

#### **Ceratophyllus ignotus** Baker.

Host:—*Thomomys bottae*. Taken once from *Scapanus californicus*.

**Ceratophyllus londoniensis** Rothsch.

Host:—*Mus rattus*.

**Ceratophyllus niger** spec. nov.

(Closely related to *C. gallinae*).

Host:—Taken from an unused chicken yard and from sparrow's nests. Occasionally found on *Homo sapiens*, *Mus norvegicus*.

**Ceratophyllus** spec. nov.

Host:—*Mus norvegicus*.

**Ceratophyllus** spec. nov.

Host:—*Microtus californicus*.

Genus **CTENOCEPHALUS** Kolenati.

**Ctenocephalus canis** (Curtis) Baker.

Host:—*Canis familiaris*. Occasionally found on *Homo sapiens*, *Mus norvegicus* and *Mus rattus*.

**Ctenocephalus felis** Rothsch.

Host:—*Felis domestica*. Occasionally found on *Homo sapiens*, *Mus Norvegicus* and once from *Mephitis occidentalis*.

Genus **HOPLOPSYLLUS** Baker.

**Hoplopsyllus anomalus** Baker.

Host—*Citellus beecheyi*. Once taken from *Mus norvegicus*.

Genus **ODONTOPSYLLUS** Baker.

**Odontopsyllus charlottensis** Baker.

Host:—*Microtus californicus*.

Genus **CTENOPSYLLUS** Kolenati.

**Ctenopsyllus musculi** (Duges) Wagner.

Hosts:—*Mus norvegicus*, *Mus rattus*, *Mus musculus*. Once found on *Microtus californicus*.

Genus **HYSTRICHOPSYLLA** Taschenberg.

**Hystrichopsylla** spec. nov.

Host:—*Microtus Californicus*.

Genus **CORYPSYLLA** gen. nov.

**Corypsylla ornatus** spec. nov.

Host:—*Scapanus Californicus*.

## Notes on the study of some Iowa Catocalae.

By R. R. ROWLEY, Louisiana, Mo., and L. BERRY, Vinton, Iowa.

On the first of June, several well-grown larvae of *Catocala parta* were found feeding on small-leaf willow by the Junior Author. When changed to a broader leaf species of *Salix* these caterpillars seemed to experience no inconvenience, but finished their larval life and pupated in due time. The "worm" is very dark brown, with longitudinal bands of lighter and darker brown. The mid-dorsal band of dark gray, forming a series of elliptical and rhomboidal expansions. The subdorsal bands are dark brown and wavy, with light diagonal lines crossing at the segment edges. A wide, gray line is below the subdorsal and a dark brown narrower line below, shaped like a string of elongate lunules. It is somewhat lighter below this band. The ventral side is pale gray, with the characteristic black spots. The true and pro legs are gray. The head, gray with a narrow intensely-black dash on the side. The head is somewhat bilobed above and slightly flattened as in *cara*. There is a hump over the 5th abdominal segment, as in *cara*, but dark brown in color. The top of the 8th abdominal segment has a cross ridge as in all the red-winged willow Catocalae. The tubercles are gray. The lateral row of setae or short bristles is as in *cara* and *amatrix*. The specimen described was two and a fourth inches long. Other larvae were obtained on the 8th. The larva of *parta* can be readily recognized by its very dark color and *cara* pattern.

One larva of *parta* taken on June 6th, in color and markings, recalled the caterpillar of *innubens*, but the band was narrow and black. The chrysalis of this larva produced on the 8th of July an unusually dark imago. The larvae of not only *parta*, but of *amatrix* and *piatrix*, were found on the bodies of willow and walnut trees, not bushes, and from four to eight feet above the ground, the two former on willow, of course, and the latter on walnut.

The imagoes of *parta*, like those of *amatrix* and *relicta*, were plentiful throughout July, August and September in the

neighborhood of Vinton; but, unlike the other two, are wary and difficult to approach, taking wing at the slightest noise. More often, perhaps, than otherwise, the moth sits, head up, and ready to take wing. It may be said to be the rule that *Catocalae* rest with the head down; however *parta* seems to rest often with the head up and *relicta* always, but not in readiness of flight in the case of the latter, as it may be easily approached and even touched with the finger, so secure does it seem in its color protection on the light bark of aspen or its resemblance to a splash of paint or bird ordure, on willow or basswood.

The Junior Author's experience with the larvae of *piatrix* was like that of the Senior Author, all died. It seems that this is a very delicate species as a larva, and it is a little strange that imagoes are so plentiful, yet if one moth should come from every fifty or even one hundred eggs laid, there would be an abundance of *piatrix* in the woods, since a single female lays from eight to nine hundred eggs.

The larvae of *parta* from Vinton, fed through to pupation at Louisiana, produced chrysalis early in June, at least not beyond the middle, and gave imagoes from the 1st to the 13th of July, making the pupal period about three weeks, the usual length of chrysalis life in the genus.

On the 18th of July the first larva of *Catocala amatrix* was formed on willow at Vinton, and on the 27th a much larger one on poplar, measuring three and three-fourths inches. *Amatrix* larva varies in ground color from light to dark gray. The middorsal dumbbell spots, light, inclosed by a dark-gray band. The lateral band below this is light gray. The spiracular band, dark gray and a series of long prostrate V's with the open end toward the head. Below, the body is light. The true and prolegs, light gray with minute dark dots which cover the whole body. The head is very light gray with a lateral black dash extending to the back, but not to the center of the back edge. Head small and with slight elevations or knobs above, as in *cara*. The top of the 5th abdominal segment, darker either side of a slight central hump as in *cara*.

Tubercles light at end but dark at base. The two tubercles on top of the 8th abdominal segment raised into a slight ridge. The hump over the 5th abdominal segment is gray instead of yellow, as in *cara*. The lateral row of setae of short but distinct bristles. A yellowish shade covers most of the ventral surface. The ventral spots are intensely black. On the side of the 6th abdominal segment, the lateral dark band of lunules is darkest. Head very small. The full grown larva is unusually broad or flat. The spiracles are almost black. The body bristles are few and very short. In the small, flat head, with its upper short, horn-like projections, the elliptical cross, hump over the 8th and 9th abdominal segments, *parta*, *cara* and *amatrix* agree, barring the color. The larva found on willow began spinning its cocoon on the 21st of July and pupated on the 26th. The chrysalis gave an imago of *C. amatrix* var. *nurus* on the 15th of August, lacking one day of having been a chrysalis, three weeks.

The imago from the larva taken on the 27th of July was a fine, large *nurus* and emerged on the 25th of August.

*Catocala concumbens* is not unusual in the middle part of summer at Vinton, but its larva has thus far escaped us, though willow, its reputed food plant, has been closely searched. A rarer moth, *C. cerogama*, and somewhat earlier, has also escaped us in larval form, despite the fact that linden has been under close observation.

Among the rarer forms at Vinton is a *Catocala* somewhat like *pura*, but a shade too dark and a species not unlike *hermia*. If there were enough variation in *Catocala unijuga* both of these forms might be considered varieties of that species, but *unijuga* itself is rare at Vinton.

To be seen in its beauty, *Catocala concumbens*, the daintiest of all the American species, must be bred, since even apparently fresh specimens are usually torn or rubbed. Its habits must be somewhat like those of *epione*, a species so difficult to get in a perfect condition.

We imagine the larva of *concumbens* is of the *cara* type, that is if it is a willow feeder.

*C. ultronia* and its several varieties are not uncommon at Vinton, while *vidua*, *epione* and *paleogama* are rare. *Habilis* is the only hickory feeder that is at all plentiful. Of course, *cara* is abundant. We are not attempting to mention all the species of *Catocala* that fly at Vinton, only the forms that came under our observation this year. The fauna is likely a full one.

The senior author of this article has been puzzled for two or three years over the variation in the larvae of *C. piatrix*, unable to bring to maturity the most striking forms and finding no variation in the imagoes, while we are able to demonstrate, in the case of *parta*, that the variation in the caterpillars does give variation in the moths. The normal larva has alternate longitudinal bands of lighter and darker color, while the most striking variation has a brownish-gray color, without any stripes except a narrow black dorsal band. The imago from this abnormal larva is distinct enough to be a variety and, probably is. We wonder if the variation in *relicta* and *amatrix* is noticeable in the larvae! We hope to have a chance to find out.

After the moth season had closed, the Junior Author carried the study of *Catocala* to the food plants of the various species of the genus and busied herself with searches for ova, and she has been abundantly rewarded. Eggs of *cara*, *amatrix* and *parta* have been found under and between bits of bark from the height of four feet above the base to the very tops of the willow trees. Eggs of *ultronia* and, perhaps, *grynea* under the bark of plum, and after much searching, the ova of *relicta* on the outside of Aspen bark, with no protection against weather or foes unless they are color protected.

We were also very successful in securing eggs of the following species from two males confined in small tin boxes: *cara*, *amatrix*, *cerogama*, *relicta*, *amatrix* var. *nurus*, *relicta* var. *clara*.

*Neogama* is among the walnut feeders at Vinton, and, doubt-doubtless, as delicate a larva as *piatrix*.

Our notes on the resting places and habits of the imagoes



are as follows: *parta* either high or low, usually head up, much the wariest of Catocalae, hearing well, and taking flight at the snapping of leaves underfoot; *cerogama* low on linden, head down; *ilia* and its varieties occasionally on linden, oftener on oak, very sluggish; *neogama* and *palaeogama* on white oak and linden, rather low; *Ultronia* and its varieties on hickory and linden, rather low; *grynea* on linden; *amica* on oak and linden, *resecta* on oak, moderately low *concupens* on elm and linden, at the very base of the tree; *pura* (?) on linden, both high and low; *relicta* on burr oak; *amatrix* on linden and elm. Both *amatrix* and *cara* are often found about porches, sheds and even on the side of the house. Mr. Dodge says *junctiona*, like *cara*, is to be found about sheds. This is probably true of *zealshi* also, while *luciana* takes refuge in holes in the bank, as deserted swallow nests, on the prairies of Nebraska, on the authority of Dodge again.

A *concupens* was taken on the 16th of August on a very large elm tree, the lower part of which was moss covered. Some bits of the moss were torn off and in one of these places sat the moth hardly distinguishable from the bark.

Many good *amatrix*, *cara* and *concupens* were taken on willow and aspen covered with *Ampelopsis* along the edge of a slough in an open place.

The first *relicta* were taken August 25th, low on aspen and white oak.

After a hot, dry spell of some weeks, it rained on the 28th of August, and after that there were more Catocalae about Vinton than at any time during the summer. *Relicta* was especially numerous. In addition to the latter, *cerogama*, *habilis*, *vidua* *palaeogama*, *resecta*, *piatrix*, *amica* and *grynea*. Most of these were fresh as if just from chrysalids. The fresh *relicta* were always near willow trees. On oak they look like lichens, on aspen they assimilate with the bark.

On September 4th several fresh specimens of *parta* were taken, a month or more after their first appearance.

*Amatrix* was very abundant in September, and specimens were taken on the 11th and 12th at the base of burr oak, elm

and linden, on the underside of leaning lindens and in openings of hollow trees.

The first *unijuga* was taken on September 5th. Quite all the species mentioned in this article were abundant from the 13th to the 15th of September. The supposed *hermia* was taken on the 16th of September and at the same time the woods were full of *amatrix*. The supposed *pura* were taken not later than August 2d. The last *parta* was seen on the 3d of October.

The egg of *Catocala cerogama* is small, almost black and smooth looking to the eye. Depressed spherical. Meridian plications small, low, smooth looking. But little flattened on the attachment surface. No well-outlined polar zone, a mere smooth surface without plications. The lateral plications or ridges bifurcate about the equatorial region, but there is no distinct zone there. In the sunlight the color seems to be a dark reddish black. The dark smooth look is the chief characteristic.

The egg of *Catocala relictæ* of medium size, dark green, with a dark brown narrow equatorial zone. It is a slightly flattened sphere. There are about eighteen meridian striations that fork just above the equatorial zone. Polar region without plications and with two slightly ridge-like concentric circumferences. Very fine cross lines or parallels. Slightly flattened at attached pole. The egg of *Catocala concumbens* is of medium size, dark lead color. Eighteen strong meridian plications that bifurcate at the equatorial zone and with further implanted plications, giving many more than in the eggs of *relictæ*. Depressed spherical. A little concave on attached side. Plications toward the pole strong and with deep depressions between. Free polar zone without ridge-like parallels or rims. The chief characteristics are the numerous plications in the equatorial zone.

The egg of *cara* is small, dark brown, with almost white hemispherical, faintly red-brown. Eighteen to twenty-two rather strong meridian striations, bifurcating at the narrow equatorial zone. The free polar region is a depression about a slight polar elevation. Flat on the attached surface.

The egg of *ilia* is large, slightly elliptical in outline, hemi-strong meridian plications, 18 in number. Polar zone a little flattened and with a slight rim, dark and looking like a hole to the naked eye. The plications bifurcate once or twice in the equatorial zone. Flattened on the attached side. The strong white meridian plications and the dark polar zone are the chief characteristics.

The egg of *ilia* is large, slightly elliptical in outline, hemispheric, dark brown, with a white equatorial line. Pole slightly tubercular, but the area is without a bounding rim. Meridian plications bifurcate near the equator and plications are implanted nearer the pole than usual in *Catocala* eggs. No distinct equatorial zone. Surface of attachment, flat.

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## A new species of *Systropus* (Bombylidae).

BY NATHAN BANKS.

### *Systropus arizonicus* n. sp.

Face whitish, mouthparts and antennæ black, thorax black, a yellow spot over base of each anterior coxa; a yellow stripe on each upper side from humerus to wings, expanded at each end, and in front with a narrow line passing down the front of thorax; a triangular yellow spot at posterior base of wings; and a smaller yellow spot at each posterior corner of the metanotum. Abdomen black at base and at tip, red in middle, the last three segments black above and below; the black of basal segment extending back on dorsum of next segment as a narrow dorsal line. Wings uniformly blackish, halteres brown. Legs black; the anterior and middle femora at tip and these tibiæ beneath yellowish; the apical fifth of hind femur, extreme base of tibia, and the first tarsal joint yellow. The second joint of the antennæ is about as long as the third; the upper branch of third longitudinal vein is angulate near base (not simply curved as in *S. macer*). Length.

From Palmerlee, Arizona (Biedermann).

Four of the Central American species, *similis*, *rogersi*, *rufigentris* and *sallei* have the first tarsal joint of hind legs pale as in this species. From all of these *S. arizonicus* differs in having the abdomen black at both ends. It is nearer to *S. similis* and *rogersi*, but both of these have the front legs yellow, and *similis* has a hoary median stripe on thorax, and in neither are the thoracic marks the same as in *S. arizonicus*. The three species of Karsch have black legs. The reference to these species in the Aldrich Catalogue is wrong; the journal is the Zeitschr. Ges. Naturw. (3) V, 1880. The *S. ammophiloides* of Townsend is a very different form.

## A Revision of the genus *Calospasta* LeConte.

By F. CREIGHTON WELLMAN.

The genus *Calospasta* was founded by Leconte (Class. Col. N. Amer., 1862, p. 273) with *Epicauta elegans* Lec. as type. While obviously related to *Tegrodera* Lec. and *Eupompha* Lec. yet the genus would appear to be a good one, bringing together what is, on the whole, a natural little group of species, although two forms hitherto included will have to be excluded (*vide infra*). The home of the genus seems to be the southern part of North America, especially southern California, though at least one species (*sulcifrons* Champ.) occurs in Mexico. In looking through the material referred to this genus in the United States National Museum and in the Philadelphia Academy of Natural Sciences some points of interest have come to light which are herewith presented.

My arrangement of the material which I have examined is as follows—this is not yet proposed as an entirely natural one, but as convenient in comparing the characters of the different species.

### Genus **GYNAPTERYX** Fairm. et Germ.

*Gynapteryx* Fairm. et Germ, Ann. Soc. Ent. Fr., 1863, p. 260.

*Gynapteryx* Germ. et Har., Cat. Col., vii, 1870, p. 2130.

#### 1. ***Gynapteryx opacus*** G. Horn.

*Megetra opaca* G. Horn, Trans. Am. Ent. Soc., II, p. 139, ♀.

*Calospasta opaca* G. Horn, Proc. Cal. Acad. Sci., 2, IV, p. 438, ♂ ♀.

♂.—General form as in the genus *Tetraonyx* Latr., entirely black, opaque, head and thorax rather smooth, antennae moniliform, elytra varying from punctate to coarsely scabrous, winged. Length 12 mm.

♀.—General form as in the genus *Megetra* Lec., black, opaque, head slightly punctured on occiput, thorax pentagonal, broader than long, sides obtusely angulate, elytra intricately rugose, apterous. Length 15 mm.

There seems to be no doubt but that these forms represent one species, although in the apterous ♀ the meso-coxae of course overlap the metasternum while in the winged male they do not. They have been taken together and *in copula* and I have before me 69 specimens (40 ♂'s and 29

♀'s) which seem to prove conclusively that we are only dealing with a remarkable sexual dimorphism. The species fits fairly well in Fairmaire and Germain's genus *Gynapteryx* to which I have referred it. The only character in which *M. opaca* G. Horn differs structurally from their diagnosis of *Gynapteryx* is in having unequal claws, and I am disinclined to propose a new genus on this character (which is easily misinterpreted) without an examination of the type of *Gynapteryx*, the which I would rather expect to show the claws subequal, just as we have one species of *Calospasta* (*C. viridis*) with the claws of nearly equal length. Dr. Geo H. Horn, on the occasion of the discovery of the ♂♂ of "*Megetra*" *opaca* by Prof. D. W. Coquillett, discussed the systematic position of his species but apparently was not acquainted with Fairmaire and Germain's genus, as he would certainly have referred to so remarkable a coincidence as a second species with apterous ♀, had he known of it. Horn after examining the ♂'s of Coquillett's collection now before me, placed *M. opaca* in Lecomte's genus *Calospasta*. In doing this he remarks regarding his species, as did Fairmaire and Germain five years before regarding theirs, that such forms mark the transition between the Meloine and Lyttine groups of the family. The only other species of *Gynapteryx* is *flavocinctus* Fairm. et Germ., the type of the genus. It can be separated from Horn's species as follows:

♂.—Nitid, thorax coarsely punctate, elytra black, with yellow markings.

**flavocinctus.**

Opaque, thorax almost smooth, elytra entirely black . . . . . **opacus.**

♀.—Head and thorax reticulated, elytra testaceous . . . . . **flavocinctus.**

Head and thorax almost smooth, elytra black . . . . . **opacus.**

Genus \* **PLEUROPASTA** Wellm., gen. nov.

*A Calospastae Lec. affinis sed differt caput inter oculus gibbosum, vertex valde rotundatus; elytrisque fortiter costatis. ♂ tarsi antici simplicibus.*

*Species typica Calospasta mirabilis* G. Horn.

Genus allied to *Calospasta* Lec. Head with vertex very

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\* *πλερα*, costae; *πασσω*, orno.

rounded, gibbous between the bases of the antennae; *antennae* as in *Calospasta*, very closely jointed, the articulations scarcely visible; *elytra* strongly costate somewhat as in *Pleuropompha* Lec.; anterior tarsi of ♂ simple.

2. *Pleuropasta mirabilis* G. Horn.

*Calospasta mirabilis* G. Horn, Trans. Am. Ent. Soc., 1870, p. 121.

Pale rufous except the antennae which are lemon yellow with rufous markings. Head oval, very rounded at vertex, gibbous between bases of antennae, with a few scattered punctures. Thorax oval, deeply impressed medianly. Elytra with margins reflexed and with four conspicuous, elevated costae on each elytron; ♂ front tarsi simple, but last ventral segment emarginate. Length 9.5 mm.

Genus **CALOSPASTA** Lec.

*Calospasta* Leconte, Class. Col. N. Amer. 1862, p. 273.

*Calospasta* Horn, Trans. Amer. Ent. Soc., 1870, p. 92.

*Calopasta* Gemm. et Har., Cat. Col., 1870, p. 2147.

I am retaining in this genus twelve species including one that is new. These may be separated as by the following table.

Spurs of hind tibiae similar.

Spurs of hind tibiae slender and pointed.

Face longitudinally impressed.

Black, with yellowish red head and humera . . . . . *histrionica*.

Face not longitudinally impressed.

Thorax longitudinally impressed.

Color green . . . . . *viridis*.

Thorax not longitudinally impressed.

Head and thorax punctate . . . . . *elegans*.

Head and thorax smooth . . . . . *perpulchra*.

Head punctate, thorax smooth . . . . . *decolorata*.

Spurs of hind tibiae thick and truncate.

Black, with yellowish red head and elytra . . . . . *schwarzi*.

Spurs of hind tibiae dissimilar, the inner slender and pointed, the outer thick and truncate.

Face longitudinally impressed.

Thorax punctate, with smooth space down middle. . . . *sulcifrons*.

Face not longitudinally impressed.

Entirely black.

Thorax wider than long . . . . . *fulleri*.

Thorax longer than wide . . . . . *moesta*.

Black, with red thorax.

Head and thorax punctulate and furnished with hairs. *morrisoni*.

Head and thorax smooth, without hairs . . . . *nemognathoides*.

Red, with metallic elytra and venter . . . . . *wenzeli*.

3. *Calospasta histrionica* G. Horn, Pr. Am. Phil. Soc., xxix, 1891, p. 100.  
*Calospasta histrionica* Champ., Mem., Soc. Ent. Belg., 1899, p. 169.

Black, rather nitid, head and humeri yellowish red; antennae filiform, joints rather closely articulated, head deeply impressed in median line; thorax longer than wide; elytra at base nearly twice as wide as thorax; first three joints of anterior tarsi of ♂ gibbous and deeply grooved longitudinally and last segment of abdomen slightly notched. Length 10 mm.

4. *Calospasta viridis* G. Horn, Trans. Am. Ent. Soc., 1883, p. 312.  
*Calospasta viridis* G. Horn, Proc. Amer. Phil. Soc., xxix., 1891, p. 100.

Green or bluish green, somewhat nitid, feebly pubescent; head sparsely punctate; antennae short, filiform with joints closely articulated; thorax not much wider than long, the median line somewhat impressed; elytra rugose; upper and lower portions of tarsal claws nearly equal; ♂ tarsi simple, last ventral segment emarginate. Length 7 mm.

5. *Calospasta elegans* Lec., Ann. Lyc. Nat. Hist., N. Y., v, p. 161.  
*Calospasta elegans* G. Horn, Proc. Amer. Phil. Soc., xxix, 1891, p. 101.

Black with bluish tinge to elytra; head and thorax rather sparsely punctate; antennae filiform, joints rather closely articulated all the joints being longer than wide; a deep impression just above the clypeus; elytra dull blue-black with an irregular yellow vitta on each, starting from humerus, interrupted near apex; anterior ♂ tarsi somewhat dilated, especially the first joint, and last ventral segment of abdomen feebly emarginate.

Var. *humeralis* G. Horn, Trans. Amer. Ent. Soc., 1870, p. 93, Proc. Amer. Phil. Soc. xxix, 1891, p. 101.

Elytral vitta reduced to a triangular humeral spot. Length 11 mm.

6. *Calospasta perpulchra* G. Horn, Trans. Am. Ent. Soc., 1870, p. 92.  
*Calospasta perpulchra* G. Horn, Proc. Amer. Phil. Soc. xxix, 1891, p. 101.

Dark blue; head and thorax almost black, coarsely and sparsely punctate, thorax longer than broad; elytra nearly twice as broad as thorax, with three yellow bands interrupted at the suture; ♂ tarsi and last ventral segment as in preceding species, elytral coloration variable, ranging from almost confluent yellow markings to entirely blue elytra. Length  $8\frac{1}{2}$  mm.

7. *Calospasta decolorata* G. Horn, Proc. Cal. Acad. Sci., iv, 1894, p. 437.  
*Calospasta decolorata* Champ., Mem. Soc. Ent. Belg., 1899, p. 169.

Deep violet; head irregularly punctate, antennae short compact; thorax wider than long, coarsely punctate in ♀ almost smooth in ♂; elytra at

base wider than thorax, scabrous, reddish yellow in ♂, with oval piceous spot on middle of suture in ♀; last ventral segment of ♂ notched. Length 8 mm.

8. *Calospasta schwarzi* Wellm., sp. nov.

*C. nigra*; capite (oculis et oris partibus exceptis) elytrisque flavo-rufis. Caput inter oculus valde canaliculatum. Thorax angustus latitudine longior. Scutellum subtiliter rugulosum. Elytra oblonga, rugulosa. Pedes pallido-pubescentes, femora dense punctulata; ♂ tarsi antici articularis tribus primis gibbosis, longitudinaliter non sulcatis. Long. Corp. 8.5 mm. Lat. elytr. 3 mm.

Hab. Panamint Valley, California, ab A. Koebele, Apr., 1891, collecta.

Typ. Cat. No. 12,129, U. S. N. M.

Black, head (except eyes and mouth parts) and elytra yellowish red. Head almost smooth, very sparsely and feebly punctulate, longitudinally broadly channelled in front, vertex somewhat raised. Antennae not closely joined together, second joint very short, third distinctly longer than fourth, black except third joint has the upper surface of its basal half reddish. Eyes as in *histrionica* G. Horn. Last joint of maxillary palpi obliquely truncate. Thorax rather narrow, longer than wide, almost smooth, very sparsely and feebly punctulate and with a few minute scattered hairs. Scutellum triangular, finely rugulose. Elytra oblong, rather square at humeral and apical angles, rugulose, with a few very small white hairs. Legs rather closely beset with small, fine pale hairs, the femora pretty densely punctulate. The first three tarsi of the ♂ front legs are gibbous but not excavated; under surface of body sparsely beset with pale hairs which are longer than those on the legs.

A very distinct species. Its closest ally is *histrionica* G. Horn from which it may be told at once by the ♂ anterior tarsi not being sulcate and by its concolorous elytra.

I take much pleasure in associating this interesting species with the name of Mr. E. A. Schwartz of Washington, D. C., to whom American coleopterology owes a great debt.

9. *Calospasta sulcifrons* Champ., Biol. Centr.-Amer., Col., iv, 2, p. 394.  
*Calospasta sulcifrons* Champ., Mem. Soc. Ent. Belg., 1899, p. 170.

I have not seen this species. Champion's description gives the head and thorax as reddish yellow with vertex and median stripe to thorax black; elytra black with broad reddish yellow margin to base and sides; underside metallic. The head and



thorax are nitid, sparsely and finely punctured, the former medianly channeled, the latter with a rather broad impunctate space down the middle; antennae short, filiform; elytra nearly twice as wide as thorax, finely and rugosely punctured; anterior ♂ tarsi swollen and ferruginous, and sixth ventral segment emarginate.

10. *Calospasta fulleri* G. Horn, Trans. Amer. Ent. Soc., 1878, p. 59.

*Calospasta fulleri* G. Horn, Proc. Amer. Phil. Soc. xxix, 1891, p. 101.

Entirely black, opaque form as in *Tetraonyx* Latr., surface sparsely covered with rather long black hairs; head finely sculptured, antennae stout, filiform; thorax wider than long and as wide as head; elytra nearly twice as wide as thorax, scabrous, pubescent; anterior ♂ tarsi simple, last ventral segment triangularly emarginate. Length 9.5 mm.

This species at the first glance resembles the ♂ *Gynapteryx opaca* (*vide supra*) rather closely but can be separated as follows:

Pubescence long, first two joints of antennae hairy, thorax dull, almost smooth and impunctate . . . . . *G. opaca*.

Pubescence short, first two joints of antennae not hairy, thorax somewhat nitid, coarsely, irregularly and sparsely punctured.

*G. fulleri*.

11. *Calospasta moesta* G. Horn, Trans. Am. Ent. Soc., 1878, p. 59.

*Calospasta moesta* G. Horn, Proc. Amer. Phil. Soc. xxix, 1891, p. 101.

Black, nitid, elongate; head and thorax sparsely punctured; antennae thickened from within out, joints submoniliform; thorax longer than wide, elytra nearly twice as wide at base as thorax; anterior ♂ tarsi simple and last ventral segment feebly triangularly emarginate. Length, 22 mm.

12. *Calospasta morrisoni* G. Horn, Pr. Am. Phil. Soc., xxix, 1891, p. 102.

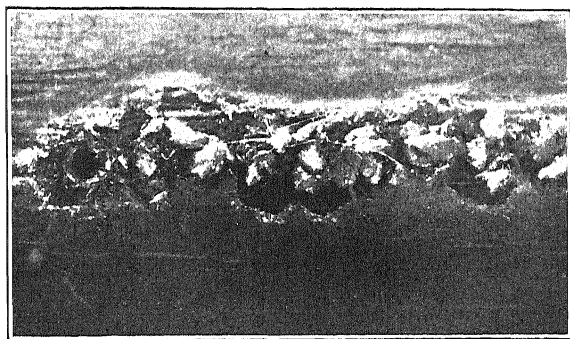
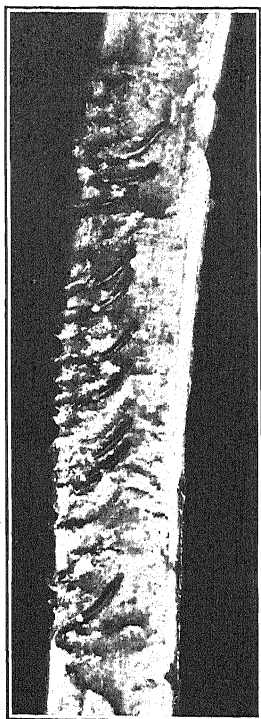
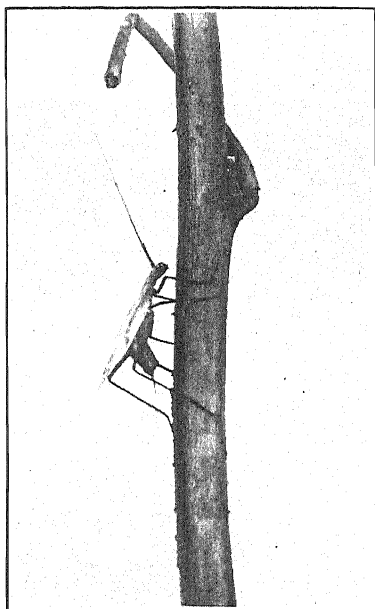
*Calospasta morrisoni* Champion, Mem. Soc. Ent. Belg., 1899, p. 170.

Black, thorax orange red, elongate; head and thorax sparsely punctate and beset with short black hairs; head usually with central rufous spot; antennae slightly thickened externally; joints moniliform; thorax scarcely longer than wide; elytra scabrous; anterior ♂ tarsi simple, last ventral segment broadly triangularly emarginate. Length, 13 mm.

13. *Calospasta nemognathoides* G. Horn, Tr. Am. Ent. Soc., 1870, p. 92.

*Calospasta nemognathoides* G. Horn, Proc. Amer. Phil. Soc. xxix, 1891, p. 102.

Black, thorax red, moderately nitid; head and thorax smooth, not provided with hairs; antennae rather slender, joints not moniliform;



OVIPOSITION OF *OECANTHUS QUADRIPUNCTATUS* BEUTENMULLER.



thorax as wide as long; elytra rather feebly scabrous; anterior ♂ tarsi simple, last ventral segment deeply incised. Length 5.4 mm.

14. *Calospasta wenzeli* Skinner, Ent. News, 1904, p. 217.

*Calospasta wenzeli*.

Head, thorax, legs and upper part of body red; elytra and lower surface of body metallic green or blue; head smooth; antennae filiform; second joint short, third three times as long as second; thorax longer than wide; elytra strongly and peculiarly sculptured, the facets of which sculpturing give the insect a scintillating appearance; the whole insect beset, more or less closely, with white hairs; anterior ♂ tarsi simple, last ventral segment triangularly emarginate. Length, 10 mm.

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## Observations on the Oviposition of *Oecanthus quadripunctatus* Beutenmüller.

By J. P. JENSEN,

Entomological Department, Cornell University.

(Plate II)

*Oecanthus quadripunctatus* has been considered by some writers a light form of *Oecanthus fasciatus* or *nigricornis*, but my observations on the habits of the two insects would seem to indicate a specific difference. The former deposits its eggs in a peculiar manner in raspberry and blackberry canes, if these are convenient, while *Oecanthus fasciatus*, also present, I have not seen oviposit similarly:

I first found a female of *Oecanthus quadripunctatus* ovipositing in the stem of a wild aster, late in the afternoon at Eagle Bend, Minnesota. The eggs were placed *singly* in the stem. In the same locality, during the month of September, I also found the females plentiful in a large patch of common thistles, and as they were on the leaves and stems of the thistles all day for several weeks and no other weeds were near, it seems probable that they also lay their eggs in the stems of these plants.

On October 5th, at 5:30 P. M., while searching for *Oecanthids* in a raspberry patch near Cornell University, I came upon a female in the act of ovipositing in a cane. She was placing her eggs in an irregular row up the stem and had already made

a dozen or more punctures. While actively at work ovipositing, the females are almost fearless. After watching one for some time she was caught, placed in a large bottle, with the piece of the cane containing the part that she was filling with eggs. The handling, no doubt, alarmed her considerably, for she laid no more eggs that evening. The next day she sat quietly under a leaf until about four o'clock, when she began running up and down the raspberry stem swaying her antennae and examining it carefully. In a few minutes she placed herself lengthwise on the cane and began completing the cavity that she had not been allowed to finish the preceding evening. She soon laid an egg, covered it, and began drilling another hole a little above and a little to one side of the last.

This took place in the Insectary of Cornell University and Professor Slingerland succeeded in getting an excellent photograph, shown in Fig. 1, of the interesting operation from life. The egg was laid in about twenty minutes, and as these insects are much more excitable after depositing an egg, the female became alarmed and after being replaced in the bottle could not be induced to continue for several hours. At 10:00 P. M. I noticed that she had been at work for some time. She had laid three or four eggs and was just in the act of covering the last one. Having finished this to her satisfaction, she began to prepare a place for the next just above and a little to one side, by tearing off pieces of the epidermis of the cane with her mouthparts and then gnawing a shallow depression. This took her about four minutes. Then advancing up the stem she felt for the place with her ovipositor and placed it in the depression almost at right angles to the stem, as shown in Fig. 1. The ovipositor seemed to slip, so she backed down to the place and gnawed the depression deeper. Again an attempt and another failure, but after gnawing deeper for the third time, it seemed satisfactory and active drilling commenced. This consists in pushing and swaying the ovipositor and abdomen back and forth the whole body working energetically, although the efforts are not as regular and forcible as in *Oecanthus niveus*, which generally lays its eggs singly

in the hard wood of trees, like cherry, peach and plum. After drilling into the cane to the full length of the ovipositor, the female widened the hole by swaying the ovipositor and abdomen from side to side and drilling out a cavity for the reception of the egg. The preparation of this receptacle took about eight minutes, but will, of course, vary with the hardness of the cane in that particular place, and also seems to vary with the temperature. On a cool evening it may take very much longer, as I have observed in this species and also in *O. nivicus*.

When the cavity was finished, the ovipositor was taken out almost entirely, and except for a swaying motion of the antennae the insect sat perfectly still. The egg was being liberated. In about a minute the ovipositor was again inserted to its full length, and by very apparent contractions of the abdomen, the egg passed down through the ovipositor into the cavity. The ovipositor was then partly lifted out, and after gently crowding in the egg she began to cover it by drilling into the sides of the hole above the egg and pushing the material loosened down on the end of it and into the cavity above. This took two or three minutes. Then the ovipositor was taken out, and backing down to the opening, she commenced tearing loose the epidermis that she could conveniently reach, and mixing it with saliva, pushed the pieces into the opening. When it was filled, she piled more above it, sticking it on with the dark, salivary secretion. This took her four minutes, and she then began to prepare a place for the next egg.

The appearance of such oviposition work on the side of a raspberry cane is shown enlarged in Fig. 2, which also shows that the last hole drilled was left open, in fact did not receive an egg. This was found true of a great many series of punctures and seems to indicate that the female after making the cavity finds that she has already expended her supply of eggs.

In Fig. 3 a raspberry cane is cut open and shows the arrangement of the eggs inside. The eggs are golden yellow in color with a white granulated cap.

It will be of interest to economic entomologists to note that

our observations show this injury to blackberry and especially raspberry canes is due not to *Oecanthus niveus* but to *Oecanthus quadripunctatus*. Dr. C. V. Riley in his 5th Missouri Report, p. 119, after describing the injury and illustrating it by the figures that have had such general use in reports and text books ever since says: "These are the eggs of the Snowy Tree Cricket (*Oecanthus niveus* Harr.), an insect briefly described in my First Report." In the Supplement to his Ninth Report p. 60, he says: "*Oecanthus niveus*. This species is common in all parts of the country, and I have proved by breeding that the eggs are those described and figured as such in the 5th Report."

In the early summer, I caught a few individuals of *Oecanthus niveus* on raspberry and blackberry bushes in the evening, but most of them were on peach, plum and cherry trees and were already at that time busy laying their eggs *singly* in the stems and branches of these trees. In October no *O. niveus* specimens were to be found on the raspberry bushes while *O. quadripunctatus* was busy ovipositing in the canes. Each afternoon I would find one or two of them at work, while *O. niveus* was still ovipositing in the stems of the trees and they outnumbered *O. quadripunctatus* at least 100 to 1. It seems, therefore, that *O. niveus* is innocent of the injury resulting from the long rows of egg-punctures in berry canes, and that we must consider *O. quadripunctatus* the only culprit at least until *O. fasciatus* or *nigricornis* has been found guilty of the same offense.

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## Two new North American Phloeothripidae.

By J. DOUGLAS HOOD, Urbana, Ill.

The present paper is based upon a collection of *Thysanoptera* made in Southern Illinois during the past few months by Mr. Lindley M. Smith, Assistant to the State Entomologist of Illinois. As the collection is large and fairly exhaustive, representing many hours of careful collecting, I take especial

pleasure in naming one of the species for Mr. Smith. I am also greatly indebted to Prof. Forbes for numerous courtesies and privileges.

Genus **TRICHOTHRIPS** Uzel, 1895.

**Trichothrips smithi** sp. nov.

Figs. 1 and 2.

*Female*.—Forma aptera.—Length about 1 mm. General color (by transmitted light) yellowish brown, with maroon hypodermal pigmentation; tube pale yellow, tipped with gray; tarsi and antennal segments 1 and 2 pale yellowish, the latter darkened laterally with blackish brown.

Head fully as wide as long; cheeks sub-parallel in basal half, anteriorly converging to eyes; dorsal and lateral surfaces sparsely and briefly spinose, faintly striate; postocular bristles slender, pointed. Eyes reduced, about three facets forming the lateral profile. Ocelli wanting. Antennæ stout, about twice as long as head; segments 1 and 2, and base of 3, pale yellow, shaded with darker; remainder of antenna dark blackish brown; segment 3 sub-conical; 4-7 sub-globose, pedicellate; 8, lanceolate, pedicellate; sense cones slender; formula\* 3, 1-1; 4, 1-1; 5, 1-1x1; 6, 1-1x1; 7 with one on dorsum near apex. Mouth cone short, reaching about two-thirds across prosternum; labium broadly rounded at apex; labrum narrowed apically; just attaining tip of labium.

Prothorax about as long as head, and (including coxæ) about twice as wide as long; all spines present, rather short, sub-acute. Pterothorax about as long as, and slightly narrower than, prothorax. Wings wanting. Legs about concolorous with body, excepting tarsi and apices of tibiæ, which are pale yellowish; fore tarsi armed with a small acute tooth.

Abdomen slightly wider than prothorax, narrowing roundly from segment 5 to base of tube. Tube about .6 as long as head, and slightly more than 1.4 times as long as its basal width; terminal bristles longer than tube.

Measurements:—Total length 1.0 mm.; head, length .155 mm., width .158 mm.; prothorax, length 1.47 mm., width (including coxæ) .30 mm.; pterothorax, width .28 mm.; abdomen, width .33 mm.; tube, length .09 mm., width at base .063 mm., at apex .033 mm. Antennæ: 1, about 25 $\mu$ ; 2, 46 $\mu$ ; 3, 49 $\mu$ ; 4, 42 $\mu$ ; 5, 42 $\mu$ ; 6, 41 $\mu$ ; 7, 36 $\mu$ ; 8, 43 $\mu$ ; total .32 mm.; width 34 $\mu$ .

\*In the formula for the antennal sense cones, the number of the antennal segment\* is followed, first, by the number of sense cones on its inner surface, and then by the number on its outer surface; rudimentary cones are expressed by an exponent preceded by a plus sign. Thus 5, 1 - 1x1 means that on the fifth antennal segment there is one fully developed sense cone on either side, with an additional rudimentary one on the outer surface.



Described from two apterous females taken on hard maple (*Acer saccharum*) at Bosky Dell, Illinois, October 20th, 1908, by Lindley M. Smith, to whom the species is respectfully inscribed.

This little species is closely allied both to *T. americanus* m.\* and *T. angusticeps* m.†, resembling them very closely in general appearance and in the form of the antennal segments. These three species form a compact group, easily distinguishable from all other described North American species of the genus by the form of the eighth antennal segment, which is conspicuously lanceolate and narrowly pedicellate. The following key will facilitate the separation of these three species:

A. Head one-quarter as long as wide; bristles slightly dilated at apex; intermediate antennal segments oblong, pedicellate, antennal segments 3 and 4 each with two sense cones on outer sub-apical surface; tube 6 as long as head. Length 1.4 mm.

***T. angusticeps* m.†**

AA. Head about as long as wide; all bristles pointed.

a. Head slightly wider than long; intermediate antennal segments subglobose, pedicellate; antennal segments 3 and 4 each with a single sense cone on outer subapical surface; tube .6 as long as head. Length 1.0 mm. . . . . ***T. smithi* sp. nov.**

aa. Head slightly longer than wide; intermediate antennal segments oblong, pedicellate; antennal segments 3 and 4 each with two sense cones on outer subapical surface; tube nearly as long as head. Length 1.7 mm. . . . . ***T. americanus* m.\***

**Genus PHYLLOTHRIPS m., 1908.**

***Phyllothrips umbripennis* sp. nov.**

Fig 3.

*Female*.—Length about 1.9 mm. Color nearly uniform black; antennal segments 3 and 4, and basal half of 5, usually yellow; fore wings grayish black in basal half; hind wings clouded at base, and with a blackish longitudinal vein reaching about to middle; marginal abdominal spines black, prominent.

Head about 1.3 times as long as wide, widest across or just behind eyes, thence narrowing evenly to base; lateral and dorsal surfaces transversely striate, sparsely, briefly, and scarcely visibly spinose; postocular

\*Bull. Ill. State Lab. Nat. Hist., Vol. VIII, Art. II, p. 366, fig. 3, a, b, and c; 1908.

†Loc. cit., p. 367, fig. 4, a and b.

bristles blunt, much shorter than eyes. Eyes large, prominent, finely faceted, not bulging. Antennæ twice as long as head; segments 1 and 2 concolorous with body, excepting apex of 2, which is paler apically; 3 and 4 nearly uniform bright yellow; 5 usually with basal half yellow; remainder of antenna dark backish brown; sense cones slender, scarcely visible; formula\*: 3, 0 - 1; 4, 1 - 2; 5, 1 1 + 1; 6, 1 1 + 1; 7 with one on dorsum near apex. Mouth cone long, slender, surpassing base of prosternum.

Prothorax about half as long as head, and (including coxæ) nearly three times as wide as long; all spines present, blunt, the pair at the posterior angles longest. Pterothorax large, heavy, slightly wider than long, and wider than prothorax; sides nearly parallel, roundly converging posteriorly and anteriorly. Wings present, about attaining base of tube; fore wings black in basal half, of equal width throughout, and with the sub-apical fringe on posterior margin double for about thirteen hairs. Legs moderately slender, black; fore tarsi unarmed.

Abdomen large, slightly wider than pterothorax, tapering roundly from segment 6 to base of tube. Tube about .6 as long as head, tapering evenly from base to apex.

Measurements:—Total length 1.94 mm.; length .27 mm.; width .21 mm.; prothorax, length .14 mm., width (including coxæ) .37 mm.; pterothorax, width .45 mm.; abdomen, width .51 mm.; tube, length .18 mm., width at base .082 mm., at apex .041 mm. Antennæ: 1, about 30 $\mu$ ; 2, 60 $\mu$ ; 3, 90 $\mu$ ; 4, 82 $\mu$ ; 5, 75 $\mu$ ; 6, 68 $\mu$ ; 7, 57 $\mu$ ; 8, 35 $\mu$ ; total .52 mm.; width 37 $\mu$ .

*Male*.—Similar to female but smaller and more slender (length about 1.7 mm.).

Described from many specimens of both sexes, from the following localities: Illinois—Bosky Dell, Carbondale, Dubois, Pulaski, on various species of oak (L. M. Smith); Michigan—Baldwin, on white oak (J. D. H.).

This species is intermediate in structure between *Liothrips* (?) *ocellatus* m.† and *Phyllothrips citricornis* m.‡ It may readily be distinguished from its congeners by means of the following key:

A. Head not more than 1.3 times as long as wide (Fig. 3).

a. Forewings brownish at extreme base; head about 1.15 times as long as wide; marginal abdominal bristles yellowish; tube .8 as long as head. . . . . P. (?) *ocellatus* m.†

\*See note on first page of this Article.

†Bull. Ill. State Lab. Nat. Hist., Vol. VIII, Art. II, p. 375; 1908.

‡Can. Ent., Vol. XL, No. 9, p. 305, Fig. 15; 1908.

- aa. Forewings nearly black in basal half; head about 1.3 times as long as wide; marginal abdominal bristles nearly black; tube .6 as long as head . . . . . *P. umbripennis* sp. nov.
- AA. Head about 1.5 times as long as wide (Fig. 4).
- b. Antennae lemon-yellow; prothoracic bristles large, rather prominent; mid-laterals present, fully as long as anterior marginals.  
*P. citricornis* m.†
- bb. Antennae with segments 4-8 nearly black; prothoracic bristles small, inconspicuous; mid-laterals wanting.  
*P. aspersus* Hinds.‡

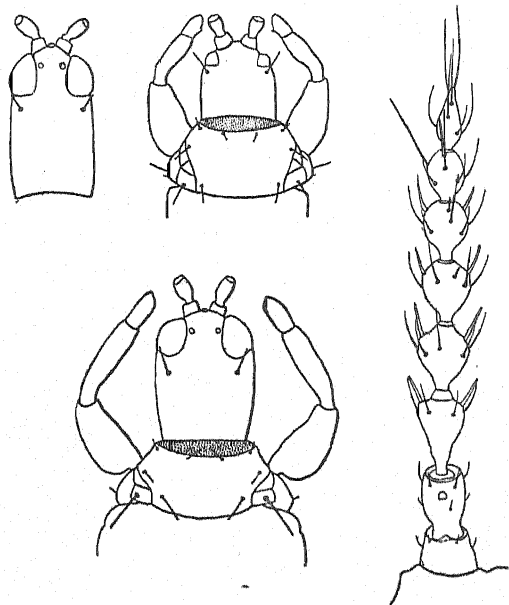


Fig. 1.—*Trichothrips smithi*, female, head and prothorax; x67.  
 Fig. 2.—*Trichothrips smithi*, female, right antenna; x206.  
 Fig. 3.—*Phyllothrips umbripennis*, female, head and prothorax; x67.  
 Fig. 4.—*Phyllothrips aspersus* Hinds, female, head; x67.

THE meetings of the Association of Economic Entomologists and the Entomological Society of America just closed in Baltimore, Md., were largely attended and very successful. There were many interesting papers read.

†Can. Ent., Vol. XL, No. 9, p. 305, fig. 15; 1908.

‡Proc. U. S. Nat. Mus., Vol. XXVI, p. 205, Pl. X, figs. 104-106; 1902.

## List of Moths Observed at Raleigh, N. Carolina.

By C. S. BRIMLEY.

This list is based mainly on moths collected during the past four years and is supplementary to the "List of Sphingidae, Saturniidae, and Ceratocampidae," published by myself in "Entomological News" for April 1904.

About 130 species have been identified by Dr. H. G. Dyar of the U. S. National Museum, and about half a dozen by Dr. H. Skinner of the Academy of Natural Sciences of Philadelphia, to both of whom I am very much indebted for their kindness in so doing. The remaining species comprising most of the most conspicuous or commoner forms have been mainly named by myself from Dr. Holland's Moth Book.

A few species will be found with the remark, "Specimen in State Museum, no date." All these were collected by myself at Raleigh, before my friend Prof. Sherman had initiated me into the mysteries of how to properly label a bug. The nomenclature and sequence is that of Dr. Dyar's check list.

### SPHINGIDAE

*Sphecodina abootii* Sw., June 19 and July 26, at sugar.

*Sphinx drupiferarum* S. & A., May 9, 1905.

*Lapara coniferarum* S. & A., May 29, 1907, one bred from pupa. Three larvae taken in fall of same year.

### SATURNIIDAE

*Hemileuca maia* Drury., I saw one flying across my yard on Nov. 22, 1906, and Mr. Woglum took one four days later.

### CERATOCAMPIDAE

*Citheronia sepulchralis* G. & R., May 25, 1906, a fine male picked up on side walk. July 4, of same year, bred a female from larva taken in the previous fall. About a dozen larvae taken in fall of 1906.

### SYNTOMIDAE

*Scepsis fulvicollis* Hubn. Mid June to late October, common.

### LITHOSIIDAE

*Crambidia uniformis* Dyar. July 5, 1907.

*Hypoprepia miniata* Hubn. May 23, 1903.

*Illice kentuckiensis* Dyar. Sept. 11, 1906, two on goldenrod flowers.

## ARCTIIDAE

*Eubaphe opella* Grt. June 14, 1907.

*Utetheisa bella* L. Abundant, June to November.

*Haploa lecontei* Bdv. May 31, 1906 in woods.

*Ecpantheria deflorata* Fab. Has only been taken in July and August.

The over wintering larvae are commoner than the adults ever are.

*Estigmene acrea* Dru. Early May to early October. Overwinters in the cocoon.

*Hyphantria cunea* Dru. Abundant. Two brooded. Late April to mid-August.

*Asia isabella* S. & A. Sep. 19, 1905, one bred. The overwintering larvae are not rare.

*Diacrisia virginica* Fab. Early May to mid-September, common.

*Apantesis arge* Dru. Late May and from July to October.

*Apantesis phyllira* Dru. Taken in 1898 and on May 21, 1900.

*Apantesis nais* Dru. July to October.

*Ammalo tenera* Hubn. June and July, not common.

*Halisidota tessellaris* S. & A. July and August. Larvae common in fall.

## AGARISTIDAE

*Alypia octomaculata* Fab. April and May, rare.

## NOCTUIDAE

*Apatela americana* Harr. May and August. Have taken the larvae on maple.

*Apatela hastulifera* S. & A. July and August. Larvae on alder.

*Apatela innotata* Guen. July and August, not common.

*Apatela morula* Grt. July and August.

*Apatela interrupta* Guen. May, July and September.

*Apatela lobeliae* Guen. July to September, rather common.

*Apatela spinigera* Guen. August.

*Apatela clarescens* Guen. Late July to early September. Larvae on plum.

*Apatela tritona* Hubn. July and August, rare.

*Apatela connecta* Grt. July and August.

*Apatela vinnula* Grt. May and August.

*Apatela afflicta* Grt. August.

*Apatela albarufa* Grt. August

*Apatela modica* Walk. In May and again in July, August and September.

*Apatela brumosa* Guen. In May and from late June to mid-September.

One of the commonest forms.

*Apatela haesitata* Grt. Late June to early September, common.

*Apatela retardata* Walk. July and August.

*Apatela noctivaga* Grt. May and again in July and August, not common.

*Apatela xyliniformis* Guen. May and again in July and August.

*Apatela impleta* Walk. Taken in the same periods as the preceding.

*Apatela obliterata* S. & A. Bred in May, taken in August. Larvae on smartweed.

*Harrisimemna trisignata* Walk. Have taken it years ago.

*Microcoelia obliterata* Grt. May and August, rare.

*Polygrammate hebraicum* Hubn. Specimen in State Museum taken by me, but no date.

*Diphthera fallax* H. S. August, rare.

*Crambodes talidiformis* Guen. August.

*Platysenta videns* Guen. July to September.

*Balsa malana* Fitch. June to August.

*Perigea vecors* Guen. May.

*Perigea epopea* Cram. September and October, rare.

*Perigea sutor* Guen. July to October, common.

*Oligia chalconica* Hubn. May to November.

*Oligia grata* Hubn. June to November.

*Hadena miseloides* Guen. June to early September.

*Hadena cariosa* Guen. June 17, 1907.

*Dipterygia scabriuscula* L. July and August.

*Actinotia ramosula* Guen. July to September.

*Pyrophila pyramidoides* Guen. July to September, not common.

*Prodenia commelinae* S. & A. July to October. Common.

*Prodenia ornithogalli* Guen. June to October.

*Laphygma frugiperda* S. & A. Common. Late July to early November.

Very common in 1906. I counted about 600 of these moths on five sugared trees on August 23, and they were present in the same numbers the next two nights. The same five trees were visited by about 300 on the night of Oct. 3.

*Rhynchagrotis anchoceliodes* Guen. October, not common.

*Agrotis badinodis* Grt. Late October, not common.

*Agrotis ypsilon* Rott. One of our most abundant cutworms. The adults have been taken from early June to late November.

*Peridroma margaritosa* Haw. and P. m. saucia Hubn. Another common cutworm. Adults from June to October.

*Peridroma incavis* Guen. Late June to late November. Larva feeds on grass.

*Noctua c-nigrum* L. early May to early June, and again from mid-August to mid-October. Not common.

*Noctua lubricans* Guen. Mid-July to mid-November.

*Feltia subgothica* Haw. Early October, rare.

*Feltia jaculifera* Guen. and var. herilis Grt. Both forms common in fall, from late August to late October.

*Feltia annexa* Treits. Possibly our commonest cutworm. Adult. have been taken from early June to late November.

*Feltia malefida* Guen. Mid-July to late October, not very common.

*Paragrotis bostoniensis* Grt. Oct. 9, 1906.

*Paragrotis messoria* Harr. Mid-August to mid-October.

- Mamestra meditata* Grt. Sep. 28, 1905.  
*Mamestra detracta* Walk. June and August, not common.  
*Mamestra legitima* Grt. August.  
*Mamestra goodellii* Grt. Aug. 25, 1907.  
*Mamestra laudabilis* Guen. Common on sugar. June and from late August to early November.  
*Nephelodes minians* Guen. Late September to November.  
*Heliophila unipuncta* Haw. Early May to early November without a break.  
*Heliophila subpunctata* Harvey. Aug. 30, 1905.  
*Heliophila extincta* Guen. Nov. 10, 1906.  
*Heliophila juncicola* Guen. July 21 and in September, 1907.  
*Heliophila phragmitidicola* Guen. Aug. 22, 1905, and July 5, 1906.  
*Orthodes crenulata* Butler. July to October.  
*Cucullia asteroides* Guen. One bred from goldenrod, Aug. 8, 1905.  
*Achatodes zeae* Harr. June 17, 1907.  
*Papaipema nitela* var *nebris* Guen. October, not common.  
*Scoliopteryx libatrix* Linn. Oct. 24, 1906.  
*Choephora fungorum* G. & R. Nov. 8, 1906.  
*Orthosia ferruginoides* Guen. October and November.  
*Glaea sericea* Morr. One on Oct. 24, 1906.  
*Chloridea virescens* Fab. August 19, 1906.  
*Heliothis armiger* Hubn. Mid-June to mid-October.  
*Schinia nundina* Dru. On goldenrod flowers in August.  
*Schinia arcifera* Guen. August and September.  
*Schinia marginata* Haw. August and September.  
*Euthisanotia unio* Hubn. Aug. 15, 1904.  
*Euthisanotia grata* Fab. Double brooded. In May and again in July and August.  
*Cirrophanus triangulifer* Grt. Specimen in State Museum without date.  
*Plusia aerea* Hubn. August and September.  
*Autographa biloba* Steph. April and May, rare.  
*Autographa verruca* Fab. August to early October, common on zinnias in gardens.  
*Autographa rogationis* Guen. Late July to early October on zinnias, at dusk.  
*Autographa ou* Guen. September.  
*Autographa brassicae* Riley. August to October.  
*Autographa oxygramma* Geyer. Common, August to October, have taken the larvae on goldenrod and bred the moths.  
*Autographa bosigera* Walk. May, rare.  
*Autographa simplex* Guen. August.  
*Ogdoconta cinereola* Guen. May to early October.  
*Paectes abrostoloides* Guen. August to October, common.  
*Paectes oculatrix* Guen. Late July to early September, rare.  
*Marasmialus inficita* Walk. Early August.

- Alabama argillacea* Hubn. Oct. 17, 22, 1903.  
*Anomis erosa* Hubn. September and early October.  
*Scolecocampa liburna* Geyer. July and September.  
*Amyna orbica* Morr. October.  
*Pleonectyptera pyralis* Hubn. July and August.  
*Phiprosopus callichtrides* Grt. August and September.  
*Eustrotia muscosula* Guen. May to August.  
*Eustrotia apicosa* Haw. May to September.  
*Eustrotia carneola* Guen. May to September.  
*Eustrotia aerea* Grt. Aug. 8, 1907.  
*Galgula hepara* Guen. June, July and November.  
*Xanthoptera nigrofimbria* Guen. In May and from July to September.  
*Metoponia obtusa* H. S. Aug. 14, 15, 1907.  
*Chamyris cerintha* Tr. Late June to mid August.  
*Tarache biplaga* Guen. July 25, 1905.  
*Tarache erastrionides* Guen. Late June to August.  
*Tarache candefacta* Hubn. August and September.  
*Fruva apicella* Grt. Aug. 31, 1907.  
*Spragueia leo* Guen. June to September, common.  
*Spragueia dama* Guen. July to September.  
*Euherrichia mollissima* Guen. Aug. 14, 1907.  
*Pangrapta decoralis* Hubn. Aug. 8, 1907.  
*Homopyralis discalis* Grt. May and from July to September.  
*Homopyralis contracta* Walk. Same period as preceding.  
*Hypsoropha hormos* Hubn. Late June to early September.  
*Drasteria erechtea* Cram. June to early September.  
*Caenurgia convallescens* Guen. June to September.  
*Meliopotes jucunda* Hubn. April and again in July and August.  
*Catocala epione* Drury. July.  
*Catocala lacrymosa* Guen. August and October.  
*Catocala viduata* Guen. July to September.  
*Catocala cara* Guen. August and September.  
*Catocala amatrix* Guen. August to October.  
*Catocala amatrix* var. *nurus* Walk. Same dates as preceding.  
*Catocala ultronia* Hubn. June and early July.  
*Catocala ilia* Cram. June, July and September.  
*Catocala innubens* Guen. July.  
*Catocala piatrix* Grt. Late July to early October, our commonest *Catocala*.  
*Catocala subnata* Grt. Once in late August.  
*Catocala grynea* Cram. June and early July.  
*Allotria elonympha* Hubn. July and August, and once in May.  
*Euparthenos nubilus* Hubn. July.  
*Panapoda rufimargo* Hubn. July and August.  
*Parallelia bistriaris* Hubn. May to early September.  
*Agmonia anilis* Dru. July and August.



*Remigia repanda* Fab. Late April to mid-May and again from July to September.

*Phurys vinculum* Guen. July and August.

*Phurys lima* Guen. Late April and early May and again in July.

*Celiptera frustulum* Guen. Early May and from late June to August.

*Anticarsia gemmatilis* Hubn. Oct. 27, 1906, Nov. 30, 1907.

*Antiblemma inexacta* Walk. April 28, 1907.

*Strenoloma lunilinea* Grt. June to September.

*Zale horrida* Hubn. In May and again in July and August.

*Phocyma lunifera* Hubn. Late June to September.

*Ypsia undularis* Dru. August.

*Homoptera lunata* Dru. and var *edusa* Dru. Has been taken in March and from May to late November. I believe it hibernates as adult.

*Homoptera calycanthata* S. & A. July and August.

*Homoptera obliqua* Guen. May, July and August.

*Epizeuxis americalis* Guen. May and June.

*Epizeuxis aemula* Hubn. July, August and October.

*Epizeuxis lubricalis* Geyer. May to early October.

*Epizeuxis denticulalis* Harvey, June, August and September.

*Zanclognatha obscuripennis* Grt. May to July.

*Zanclognatha lituralis* Hubn. July and August.

*Renia discoloralis* Guen. August.

*Renia flavipunctalis* Geyer. August.

*Bleptina caradrinalis* Guen. May, July, August.

*Heterogramma pyramusalis* Walk. August.

*Palthis asopialis* Guen. August to November.

*Palthis angulalis* Hubn. July.

*Bomolocha manalis* Walk. July.

*Bomolocha bijugalis* Walk. June and August.

*Bomolocha abalinealis* Walk. August.

*Bomolocha toreuta* Grt. July.

*Plathypena scabra* Fab. July to January. Overwinters as adult.

#### NOTODONTIDAE

*Apatelodes torrefacta* S. & A. Aug. 17, 1904.

*Melalopha inclusa* Hubn. May and July. Larvae very common on willow in fall.

*Datana ministra* Dru. Larvae very common on oak in fall.

*Datana integerrima* G. & R. Larvae observed on hickory, pecan and black walnut, in July and again in September, 1907.

*Datana contracta* Walk. Larvae usually common on oak in fall.

*Nadata gibbosa* S. & A. Late July.

*Nerice bidentata* Walk. Bred from larva on birch June 25, 1905.

*Symmerista albifrons* S. & A. May and August. Larvae very common in fall on oak.

*Dasylophia anguina* S. & A. July.

*Heterocampa obliqua* Pack. Early July.

*Heterocampa manteo* Dbl. June and July.

*Heterocampa bilineata* Pack. July.

*Schizura ipomeae* Dbl. July and August. have taken the larvae on horse chestnut and apple.

#### THYATIRIDAE

*Pseudothyatira cymatophoroides* Guen. August and early September.

*Pseudothyatira expultrix* Grt. Same time as preceding but commoner.

#### LASIOCAMPIDAE

*Malacosoma americana* Fab. Early May and June.

#### PLATYPTERYGIDAE

*Eudeilinea herminiata* Guen. May 7, 1907.

*Oreta rosea* Walk. Aug. 25, 1907.

*Platypteryx arcuata* Walk. Two bred from larvae on birch, Sep. 1 and 5, 1906.

#### GEOMETRIDAE

*Eudule mendica* Walk. July.

*Heterophleps triguttaria* H. S. July and August.

*Tephroclystis* (sp) August and September.

*Eustroma diversilineata* Hubn. June to August.

*Pernophtilota fluviata* Hubn. Sep. 27, 1907.

*Hydriomena latirupta* Walk. July and August.

*Gypsochroa sitellata* Guen. September and October.

*Cosymbia pannaria* Guen. Sep. 21, 1907.

*Synelys restrictaria* Walk. June 20, 1907.

*Eois demissaria* Hubn. Aug. 31, 1907.

*Eois ossularia* Hubn. Sept. 9, 1907.

*Chlorochlamys chloroleucaria* Guen. Sep. 21, 1907.

*Synchlora denticulata* Walk. August and September.

*Anaploides remotaria* Walk. August and September.

*Orthofidonia vestaliata* Guen. July 10, 1907.

*Sciagraphia atrofasciata* Pack. August.

*Philobia notata* Linn. July and September.

*Catopyrrha coloraria* Fab. July.

*Tornos scolopacinarius* Guen. August and September.

*Cleora pampinaria* Guen. Common in May and from July to early September.

*Epimecis virginaria* Cram. April 19, 1904.

*Therina athasitaria* Walk. Late March to early May.

*Xanthotype crocataria* Fab. June to September.

*Hyperitis amicaria* H. S. April, May and August.

*Gonodontis hypochraria* H. S. Late August.

*Gonodontis obfirmaria* Hubn. Early April.

*Euchlaena effectaria* Walk. July.

*Euchlaena amoenaria* Guen. July and August.

*Euchlaena astylusaria* Walk. Late July.

- Azeline ancetaria* Hubn. July and August.  
*Caberodes confusaria* Hubn. June to September.  
*Sabulodes transversata* Dru. July.  
*Abbotana clemataria* S. & A. July 7, 1907.

## NOLIDAE

- Celama sorghiella* Riley. Sep. 6, 1907.  
*Nigetia formosalis* Walk. June, August and September.

## COCHLIDIIDAE

- Sibine stimulea* Clem. July and August.  
*Euclea delphinii* Bdv. July 1, 1907.  
*Lithacodes fasciola* H. S. July 21, 1907.

## MEGALOPYGIDAE

- Lagoa crispata* Pack. June and July.

## PYROMORPHIDAE

- Acoloithus falsarius* Clem. June and August.  
*Pyromorpha dimidiata* H. S. May.  
*Harrisina americana* G. M. June and August.

## THYRIDAE

- Thyris maculata* Harr. June and August.  
*Thyris lugubris* Bdv. June.

## COSSIDAE

- Prionoxystus robiniae* Peck, June 11, 1902.

## SESIIDAE

- Melittia satyriniformis* Hubn. Late June to mid-August. At least partially two brooded. I bred a number from the same years larvae in late July, 1905, but towards the end of August some of the cocoons still contained living larvae not yet transformed to pupae, although they had been a month in the cocoons.

- Memythrus polistiformis* Harr. July 18, 1905, a pair in coitu. Nov. 1, 1904, one.

- Sanninoidea exitiosa* Say. August.

- Palmia ruficornis* Hy Ed. Four taken in grass in pine woods Aug. 16, 1906.

## PYRALIDAE

- Glaphria sesquialis* Hubn. June.  
*Hymenia fascialis* Cram. August to October.  
*Desmia funeralis* Hubn. June to September. At least two brooded.  
*Diastictis argyralis* Hubn. August.  
*Pilocrocis inguinalis* Guen. September on zinnia flowers at dusk.  
*Conchylodes platalis* Guen. August on zinnias at dusk.  
*Sylepta obscuralis* Led. July.  
*Diaphania nitidalis* Stoll. Late July to September.  
*Stenophyes horonalis* Guen. Sep. 19, 1907.

- Nomophila noctuella* D. & S. June 17, 1907.  
*Loxostege mancalis* Led. June to September. Two brooded. The larvae are a pest on morning glory vines.  
*Loxostege similalis* Guen. August and September.  
*Phlyctaenia ferrugalis* Hubn. Nov. 19, 1906.  
*Phlyctaenia tertialis* Guen. June and August.  
*Cindaphia bicoloralis* Guen. Aug. 2, 1907.  
*Pyrausta pterextalis* Led. August and September.  
*Pyrausta thesusalis* Walk. Aug. 30, 1907.  
*Pyrausta illibalis* Hubn. July and August.  
*Eustixia pupula* Hubn. June to August.  
*Aglossa cuprealis* Hubn. July.  
*Hypsopygia costalis* Fab. June, August and September.  
*Pyrallis farinalis* Linn. June to August.  
*Herculia olinalis* Guen. June, August and September.  
*Galasa rubidana* Walk. July 10, 1906, July 8, 1907.  
*Crambus praefectellus* Zinck. June.  
*Crambus caliginosellus* Clem. June.  
*Crambus teterellus* Zinck. Sept. 10, 1907.  
*Diatraea saccharalis* Fab. Early June, late July and August.  
*Argyria nivalis* Dru. Sept. 8, 1907.  
*Epipaschia superatalis* Clem. July 15, 1907.  
*Tetralopha humerella* Rag. July 7, 1907.  
*Monoptilota nubilella* Hulst. Aug. 2, 1907.  
*Ambesa buschiella* Dyar. Aug. 14, 1907.  
*Meroptera pravella* Grt. Aug. 14, 1907.

## PTEROPHORIDAE

- Oxyptilus tenuidactylus* Fitch. June 15, 1907.  
*Pterophorus monodactylus* Linn. Sep. 4, and Nov. 11, 1906.

## TORTRICIDAE

- Eucosma strenuana* Walk. August.  
*Archips rosaceana* Harr. June, August.  
*Platynota rostrana* Walk. June 13, 1907.  
*Tortrix albicomana* Clem. July.  
*Pharmacis sartana* Hubn. July 17, 1907.

## YPONOMEUTIDAE

- Atteva aurea* Fitch. September and October on goldenrod flowers.  
*Plutella maculipennis* Curtis. June.

## OECOPHORIDAE

- Cryptolechia sparsiciliella* Clem. July 16, 1907.

## TINEIDAE

- Acrolophus plumifrontellus* Clem. June and July.  
*Acrolophus cervinus* Wals. July.  
*Anaphora popeanella* Clem. August and September.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., JANUARY, 1909.

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In Entomological News, volume XV, page 36, 1904, it was suggested to place on the cover of each January News, the most interesting American insect described during the previous year. It was our intention to have the describers of species apply to the News for this honor and the selection to be made by the editors in conjunction with the Advisory Committee. We have not had any applications and have left the space vacant for the present. We will be glad to receive application for this space; the application to be accompanied by a suitable drawing. If we do not receive any application for the space we will be compelled to abandon the idea.

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MR. JACOB KOTINSKY has been appointed to succeed the late Mr. Alexander Craw as superintendent of Entomology of the Hawaiian Board of Agriculture, and Mr. D. B. Kuhns has been appointed assistant.

C. A. CLARK is conducting a "*Nature Experiment Station*" at Lynn, Mass., in which he has made hundreds of experiments with insects.

Mr. Clark is one of the best known naturalists in Essex County, and has the only Experiment Station of its kind in his locality. His address is 60 Lynnfield street.

**A TRUE STORY.**—The minister was making a parishional call, and the youngest member of the family, a small boy of tender years, finally mustered sufficient courage to inquire his name: "My name," replied the clergyman pleasantly, "is Mr. Jehonnet, what is your name?" Astonished out of all prudence by so singular a name and convinced that the minister was "funning," he mastered his surprise as best he could and gravely replied: "My name is Mr. G. Bumblebee."

## Doings of Societies.

The Brooklyn Entomological Society met at 55 Stuyvesant Avenue, October 1st with eighteen members present.

Prof. John B. Smith spoke of the summer's entomological happenings and remarked the steady northward progress of the *Sphecius speciosus* with a most noticeable cutting down of the prevalence of *Cicada*. The wasp has been common for at least twenty years along the centre of Long Island, burrowing in the loose sand by the railroad track. W. T. Davis who has been working over the *Cicada*, collected at Tuckerton, N. J., and got his principal supply by intercepting the female *speciosus* and stealing her prey. *Cicada canalicularis* was the species most frequently thus obtained. In the burrows tachinid larvae as secondary parasites infested a majority of the *Cicada*. C. V. Riley's familiar drawing in "Insect Life" was criticized inasmuch as it shows the wasp carrying the *Cicada* by the back. The wasp invariably grips the underside, holding the legs. After they fall to the ground the *Cicada* is pulled along, its back being smooth.

Mr. Geo. Franck and others described the flight of *Ennomos subsignarius* during the night of July 16. They were swept up by bushels and whitened the streets. Of thousands picked up, all were males. No one had observed the larvae as commoner than usual. The English sparrows destroyed vast numbers but did not eat them. They apparently picked off the wings in wanton mischief.

The great flight of 1862 was precisely similar. It was confined to the large cities and extended to Montreal. A plague of caterpillars followed the next year. Then, as this year, the females being heavier, stayed at home.

Of records of captures during the summer there was noted *Libythea bachmanni* at Bay Ridge, L. I.; *Pamphila phylaeus* at Canarsie, L. I. and Hopatcong, N. J.; *Thecla m-album* at Hopatcong, a northernmost record; *Lebia pleuritica* and *marginicollis* at Flatbush, L. I.; *Pamphila delaware* at Hopatcong. *Pamphila massasoit* was common in Orange County, N. Y. *Malachius aeneus* was common at Claremont, New Hamp-

shire. A very fortunate catch was a long series of *Cybister olivieri* in Florida. The last two are represented in very few collections.

R. P. Dow, *Recording Secretary*.

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The Brooklyn Entomological Society met Nov. 5 with twelve members present and John A. Grossbeck of the New-ark Society, a visitor.

G. W. J. Angell, a charter member of the incorporated society was re-elected, and C. P. Benedict of Staten Island elected to active membership.

A. C. Weeks reported *Hemileuca maia* at Gaphank, Oct. 18 by daylight. Jacob Doll reported taking *H. Neumoegeni* in Arizona freely at light at 11 P. M. C. J. Martin exhibited his summer's catch of beetles in Germany and Switzerland and a pair of *Catocala fraxini* with quite melanotic primaries.

Geo. Franck reported a freshly emerged *Philosamia cynthia* Nov. 5. The species had been unusually double brooded this year. Jacob Doll reported *Junonia coenia* hatching freely out of doors in November.

W. T. Davis reported that a larva of *Hemileuca maia* taken at Lakehurst, N. J. in the spring of 1907, which pupated promptly had emerged in the fall of 1908. Mr. Doll reported a *Samia gloveri* which recently hatched after being four years in the cocoon, and an *Atacus orizaba* which had been in cocoon six years and is still alive. A number of other instances were given tending to show that in the arid regions of the southwest, insects had the power to stay in pupa form over a dry year and emerge in favorable climatic environment. C. Schaeffer reported taking the pupae of a Cerambycid *Monilema ulkei* in Arizona in the soil under the cactus, *Opuntia engelmanni*. These larvae surround themselves with an earthen cell. The cell bakes hard under the summer sun, so hard that it is seemingly impossible for the insect to emerge until a copious rain softens it.

C. H. Olsen showed a section of the stem of a decaying rub-

ber plant about one and a half inches in diameter, which while in a greenhouse had been penetrated through and through by four species of scolytid beetles.

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At a regular meeting of the Feldman Collecting Social held this evening at 1523 South 13th Street, Philadelphia; the following members were present: Dr. Castle, Messrs. H. A. Wenzel, H. W. Wenzel, Seiss, Laurent, Schmitz, Harbeck, Haimbach, C. T. and G. M. Greene.

Vice-President Harbeck in the chair.

The absence of the Secretary at the beginning of the meeting prohibited the reading of minutes of previous meeting.

Mr. Wenzel, Sr. made several remarks on *Buprestis decora* and read extracts from a letter from Southern Pines, N. C. saying this species had emerged from pine in wood box in room in December. Coleoptera, the speaker said, often mature in the fall, hibernate in the imago state and emerge during the first warm spell in spring. Earliest date for *B. ultramarina* is IV-19, collected at Westville.

Mr. Laurent stated he had a male specimen of *Deilephila lineata* to emerge on Oct. 23rd. Said he had never in his experience had any species of Sphingidae emerge later than Oct. 1st when pupae had been kept out of doors. The several days of warm weather we had at that time was supposed to account for this.

Dr. Castle inquired about baking insects to quickly dry and set them. Said he had put light brown specimens of *Donacia picastris* in oven where temperature was very high and had been called away and when the specimens were taken out, 28 hours later, they were bright green in color. These were exhibited. This was discussed by the members, Mr. Haimbach stating he treated all his specimens this way without harm except putting a sheen on the wings of Odonata and said it was very good when collecting at the shore where air was continually moist; insects dried in the regular way there were noticed to droop their wings in a couple of weeks' time.

Mr. Harbeck exhibited six species of the Anthomyid genus



*Lispa: consanguinea, sociabilis, polita, uliginosa, albitarsis* and *tentaculata*. He stated that these flies were found walking around on muddy places and pond lily's leaves. Five species of those shown were new to the New Jersey list, only one species is recorded there and one more has been added in the supplementary list by Mr. Johnson.

GEO. M. GREENE, *Ass't Sec'y.*

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A meeting of the Newark Entomological Society was held in Turn Hall, September 13, with fifteen members present.

Mr. Broadwell spoke of the invasion of *Ennomos subsignarius* in Newark last July. Discussion brought out the fact that the insects occurred as far north from New York City as Oliveira, Ulster County, N. Y.; westward as far as Paterson, N. J., where they were equally as numerous as in Newark and New York; eastward as far as New Haven, Conn.; and southward to New Brunswick and Morgan, N. J. At both of these southern points only a single specimen was taken.

Prof. Smith stated that *Zeuseura pyrina* was extending its range southward in New Jersey, and was now found in some numbers at Maurer and Eatontown. He also said that reports claimed it to be injurious in the vicinity of Boston.

Mr. Grossbeck spoke of the abundance of *Arsilonche albo-venosa* larvae present on the cat-tail marshes near Snake Hill in 1907. Thousands of larvae were spread over several acres of territory and three to six individuals were found on every blade of the plant. Search in the fall of the year resulted in the finding of only two cocoons spun in among the sheaths. Nothing was found on the ground or under the various objects on the meadow. Parasitism was small if not altogether absent since of the hundred or more larvae brought into the laboratory, none were infested. The question arises as to what became of these larvae?

Mr. Herpers spoke of the numerous gorgeous butterflies he had seen in Topeka, Mexico, last winter, where he had been led to believe they were scarce at that season of the year. Many species were represented.

The October meeting of the Newark Entomological Society was held on the 18th of the month, at Turn Hall, with twenty-three members and five visitors present. Mr. R. P. Dow, of Brooklyn, was elected a member. Following the meeting the members and guests proceeded to the dining hall, where a collation was served in honor of the twenty-fourth anniversary of the society. Speeches were made by Prof. Smith and Messrs. Beutenmüller, Leng, Davis, Dow and Kearfott, and music was furnished by Prof. Wormsbacher.

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A meeting of the Newark Entomological Society was held at Turn Hall on November 8th, with twelve members present. Prof. Wormsbacher reported *Nonagria oblonga* Grt. from Jersey City, Homestead and Guttenberg, N. J., in August. He said the species was abundant around the electric light. He also reported the capture of *Acronycta radcliffei* and *Mamestra purpurissata* at Edgewater Heights, the former on June 29, the latter on September 7, and *Hypocala hillii* at Guttenberg on September 15. A friend of his captured a battered specimen of *Papilio palamedes* Dru. at Fairview on July 8, this being the most northern point from which the species has been recorded and a new record for New Jersey. According to Holland this species does not extend north of Southern Virginia or Missouri.\*

Mr. Buchholz spoke of the larvae of *Gloveria arizonensis* that he found hiding in a cedar stump in Arizona. The stump was reduced almost to dust by borers, leaving only a fragile framework. They were of two sizes, the larger ones maturing the same year, the smaller ones hibernating and producing imagoes the following year. This habit of requiring two years to complete their development was later demonstrated to be the regular practice of the species. Mr. Buchholz also reported *Dilophonota alope* Dru. from Elizabeth, N. J., September 27.

Mr. Bischoff reported the capture of two specimens of *Neoclytus jouteli* at Lakehurst, N. J., on July 4, 1907, and three

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\* Philadelphia by Skinner.

specimens at Rahway, N. J., on August 2, one of the latter taken by Mr. Grossbeck. Aside from these five examples the species is known only by the unique type described by Mr. Davis.

Mr. Grossbeck exhibited a cocoon of *Tropaea luna* which was spun in the neck of a bottle, completely corking up the mouth and projecting about three-eighths of an inch over the top.

JOHN A. GROSSBECK, *Secretary*.

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### ALEXANDER CRAW.

The following resolutions on the death of Alexander Craw, were presented by the Executive Committee and unanimously adopted by the Hawaii Entomological Society.

*Whereas*, The Hawaiian Entomological Society has learned with profound sorrow of the death of its esteemed member, Alexander Craw, June 28, 1908, be it therefore

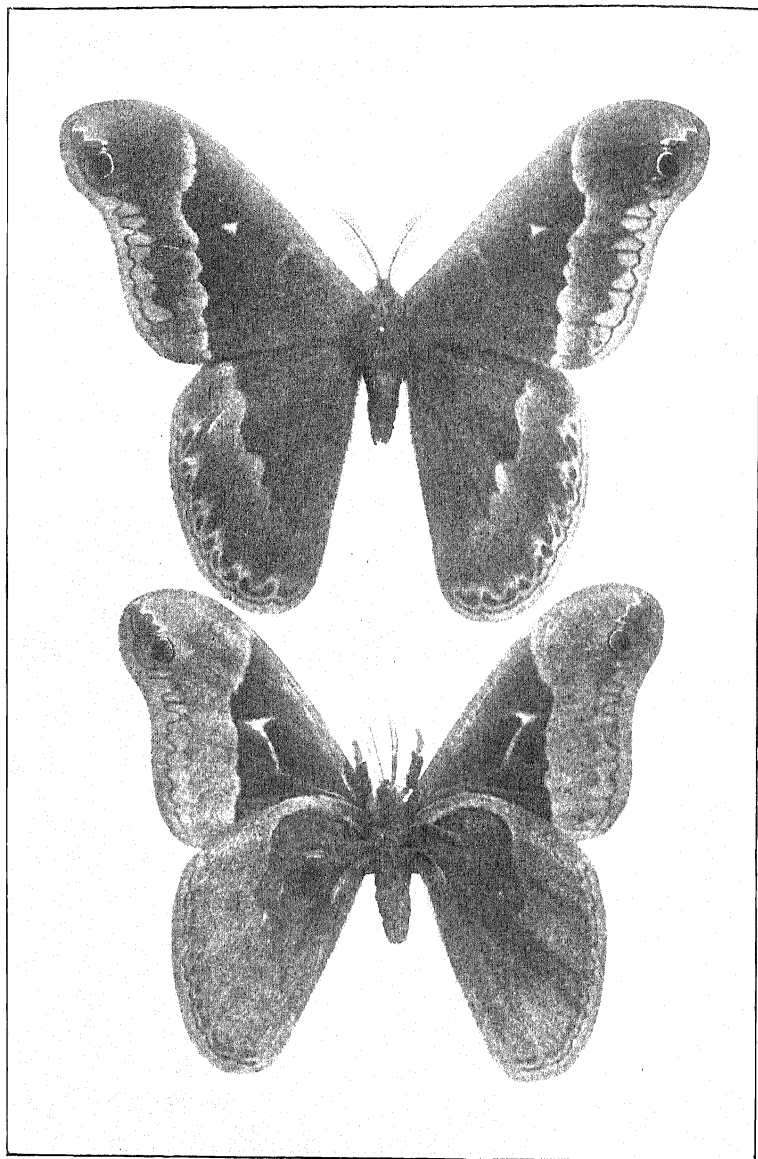
*Resolved*, That the Society, through its Secretary, transmit to the bereaved family its deepest sympathy, and this expression of its appreciation of the irreparable loss sustained. Mr. Craw was one of the founders of the Society; was its first Vice-President and always took a keen interest in the Society, attending the meetings faithfully unless prevented by matters of health or duty and was ever ready to join in the discussions of practical entomological interest. He was a sincere, kind, generous, and hospitable man, and in the few years spent in our midst had endeared himself into the hearts of all with whom he was associated.

*Be it further Resolved*, That these resolutions be spread on the minutes of the Society.

An interesting biographical sketch of Alexander Craw was published by Jacob Kotinsky in the Proc. Haw. Ent. Soc., II, No. 1, Oct., 1908.

OTTO H. SWEZEY,  
R. C. L. PERKINS,  
JACOB KOTINSKY,  
Executive Committee.





JONES ON CALLOSAMIA CAROLINA.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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### Additional Notes on *Callosamia carolina*.

By FRANK MORTON JONES, Wilmington, Delaware.

(Plates III, IV)

A brief description of an interesting form of *Callosamia angulifera* was published in ENTOMOLOGICAL NEWS for May, 1908 (page 231). It is now possible to give an illustration of this moth and of its cocoons, which differ remarkably from those of typical *angulifera*. I first found these cocoons in May, 1907, in Berkeley County, South Carolina. At that time eleven cocoons were found, all hanging on swamp-magnolia or bay-trees (*Magnolia glauca*); all of these cocoons were empty, and were so evidently different from any of our well-known species that I made every effort to procure eggs, larvae, or live cocoons. Early in 1908 I finally secured thirty live cocoons and many more empty ones, all gathered within four miles of the original locality and from the same food-plant, *Magnolia glauca*.

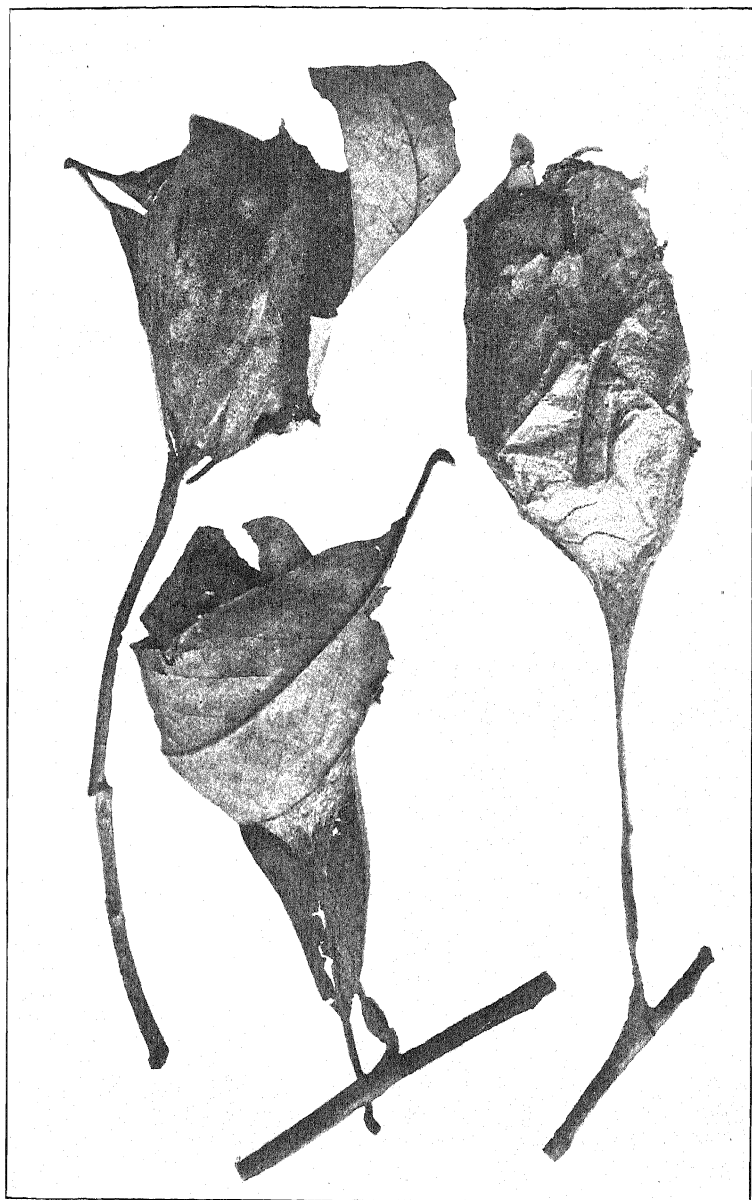
The cocoon of *carolina* bears a superficial resemblance to that of *polyphemus*, though it is not so regularly rounded or nearly so firm in texture outwardly; for unlike *polyphemus* it is double, the firm inner cocoon being no larger than a large *promethea*, and like that species, open at the top with converging threads. The cocoon is suspended by a strong, slender

thread or stem varying from a fraction of an inch to four inches in length, about two inches being most usual. The outside dimensions are: Length, two to two and a half inches; diameter, about one and a quarter inches. The silk is pale in color and lustrous, and the outside of the cocoon usually has several large magnolia leaves irregularly attached. From *angulifera* it differs in size, in its looser texture outwardly, in its much more decidedly double character, and in the possession of a stem,—evidently a rare character in *angulifera*.

The moths from these cocoons emerged April 1st to 21st, fourteen males and fifteen females. They exhibit very little variation among themselves and present constant differences from any *angulifera* I have been able to see, as is apparent from the description (Ent. News, XIX, page 231) and the illustration herewith. One of the females was mated, and from April 12th to 17th she deposited 191 eggs. The eggs, laid in irregular rows, are similar in size and appearance to those of *angulifera*. A few hours after being deposited they are chalky white in color, sometimes irregularly splotched with brown, evidently stained with the fluid by which they are attached to the leaf. At out-of-door temperature they began to hatch April 19th, some being delayed until May 12th by a spell of cold, wet weather. *Magnolia glauca* not being procurable near Wilmington, Delaware, when they hatched, the young larvae were tried with another species of magnolia, with sassafras, spice-bush, wild cherry, and tulip-tree. They refused all but the last named. On tulip-tree out of doors, they all succumbed to a cold rain; a few, fed indoors, survived through all the larval molts. They showed considerable color variation, and as direct comparison was impossible, no character was detected to separate them positively from the larva of *angulifera*.

The newly hatched larvae are yellow with two narrow black rings on segments T<sub>2</sub>, A<sub>8</sub> inclusive, and one on each of the remaining segments. The clusters of setae on the first thoracic and last abdominal segments are black; the median cluster on A<sub>8</sub> is dark, and all the rest are yellow. The head is black with a white band across the front and a white spot on either side above. Feet black.

*Second larval stage.*—But little changed except in size; the light markings on the head are broader and pale yellow in color.



JONES ON CALLOSAMIA CAROLINA.





*Third larval stage.*—Yellow, ringed with black as before; whitish between the segments. Head yellowish-green; a black band above the mouth parts, a black band across the front not quite joining another on each side. Feet yellow. Lateral warts on  $T_1$  yellow; the remaining ones on this segment, those on  $A_{10}$ , and the lateral warts on  $A_8$ , black. On all the other segments the warts usually yellow; sometimes the submedian row yellow, the others black; sometimes the corresponding warts on one side yellow, on the other side black.

*Fourth larval stage.*—Bluish-white, powdery, with the black transverse lines confined to the dorsal area and fading out as the larva grows. Head yellowish green banded with black as before, the bands narrower. Feet yellow. Anal plate and claspers yellow with a black band and black horseshoe mark. The large dorsal tubercles on  $T_2$  and  $T_3$  spined, orange-color becoming red later, and ringed with black at base. Median wart on  $A_8$  large spined, pale, yellow ringed with black at base. All the remaining warts black, and spined or roughened, the submedian rows more prominently so; except on the thoracic segments, the lateral rows, although slightly spined, approach the smooth shining appearance of the next stage. Occasionally some variation in the color of the warts, the submedian row on the abdominal segments in some examples yellow instead of black.

*Fifth larval stage.*—Color as before; no trace of the black rings. Head yellow, the black bands still narrower and interrupted. Feet yellow. Anal plate edged with yellow and black. Anal claspers green with a black hollow triangle. Dorsal tubercles on  $T_2$  and  $T_3$  smooth, coral-red, yellow at base with a black ring. Median tubercle on  $A_8$  yellow with a black ring at base. All the other tubercles black, rounded, smooth and shining. A black spot over each abdominal foot. In this and the preceding stage the substigmatal ridge is prominent, but not differing noticeably in color from the other portions. No measurements are given in the above descriptions, but the sizes are approximately those of *promethea*. The moths, especially the males, are smaller and slighter than typical *angulifera* and but little above the average size of *promethea*.

I have not been able to learn anything further of the distribution of this form, or whether it intergrades with typical *angulifera*. Its abundance locally and the persistence of its differences from *angulifera* through all obtainable examples seem to indicate a well defined local race. Co-types and specimens of the cocoons are in my own collection and also in those of Dr. William Barnes, of the Academy of Natural Sciences, Philadelphia, and of the U. S. National Museum (Accession No. 48,676).

## Synonymy of Certain Tortricidae.

By W. D. KEARFOOT, Montclair, N. J.

While collecting data for a review of this sub-family, I recently read a series of papers by the late Chas. G. Barrett in the "Entomologist's Monthly Magazine," entitled "Notes on British Tortrices;" of particular interest were certain remarks on pp. 35 and 36, Vol. xxiv, 1887, wherein Mr. Barrett calls attention to four names that had been recently expunged from the British lists, as representing North American species.

These remarks may be quoted in full for the benefit of North American students.

"In Mr. Shepherd's collection are also several of the original types, on the faith of which species were included in our fauna, which were afterwards expunged as aliens. They all appear in Stephens' British Museum Catalogue, but only as reputed British species, and with the locality, "North America?" These specimens are carefully labelled as follows:

"*Peregrinana*"

"*Obliquana*, Bent."

"These names appear in Stephens' Catalogue, page 90, and *obliquana* is figured very accurately by Mr. Humphreys (W. and H., Vol. ii, pl. 80, fig. 8). I believe this species to be *Pandemis albariana* Walk., a native of North America. It agrees very well with the figure in Lord Walsingham's work on North American Tortricidae, plate 62, fig. 10."

"*Trileucana*.—This is *Ptycholoma persicana*, Fitch (*blan-dana* Clemens, *fragariana* Packard), agreeing well with North American specimens sent me some years ago by Professor Fernald, of Maine State College. In Stephens' list, p. 90, *Croesia trileucana*.

"*Biustulana* (two specimens).—This is figured in Westwood and Humphreys' work (Vol. ii, pl. 80, fig. 10). Stephens says of it that he has seen only two specimens, which he believes came from the West of England. He might well have said farther west. It is *Ptycholoma melaleucana* Zeller, from Virginia, Maine, Pennsylvania and Ohio. It is well figured

by Lord Walsingham (pl. 62, fig. 8), and agrees with my types from Professor Fernald."

"*Flavofasciana*."—This moth is figured under the same name by Humphreys (W. and H., Vol. ii, pl. 99, fig. 16), with the statement—"From Mr. Stone's collection, now in the cabinet of Mr. Bentley." From Mr. Bentley's cabinet it passed to Mr. Shepherd's. It is *Sericoris instrutana* Clemens, from North America, and agrees with types from Prof. Fernald, sent as *Exartema fasciatana*."

The following synonymy is arranged to the best of my ability, but with the limitations of one unfamiliar with the class of work; I sincerely hope that should there be errors, they will be promptly corrected.

***Olethreutes flavofasciana* Westwood.**

*Rhyacionia flavofasciana* West. & H., Br. Moths, II, 173, pl. 99, p. 16, 1844.

*Sericoris flavofasciana* Sph., List B. M., X, 95, 1852.

*Rhyacionia flavofasciana* West. & H., Br. Moths, 2d Ed., II, 173, pl. 99, p. 16, 1857.

*Exartema fasciatana* var. (?) Clem., Pro. Ac. N. Sc., 357, 1860.

*Sericoris instrutana* Clem., Pro. Ent. Soc. Ph., V, 135, 1865.

*Sericoris poana* Zell., V. Z.—b. Ges. Wien, XXV, 282, 1875.

*Sericoris instrutana* Fern., Tr. A. E. S., X, 35, 1882.

*Sericoris flavafasciana* Barrett, Ent. Mo. Mag., XXIV, 36, 1887.

*Olethreutes instrutana* Fern., Bull. 52, U. S. N. M., No. 5064, 1902.

*Olethreutes instrutana* Kearf., Smith's List, Lep. No. Am., No. 5467, 1903.

Mr. Barrett says of this species "It is *Sericoris instrutana* Clem. from North America, and agrees with types from Prof. Fernald sent as *Exartema fasciatana*." In Westwood's British Moths, both editions, the figures are more like *instrutana*, while the rather full description is undoubtedly of this species rather than *fasciatana*, hence I prefer to follow Barrett as Fernald did not seem able to separate the two species, though belonging to different genera; hence *flavofasciana* Westw. will take the place of *instrutana* Clem.

***Archips schreberiana* Stephens.**

*Lozotaenia schreberiana* (?) Sph., Cat. Br. Ins., II, 172, No. 6879, 1829.

*Lozotaenia schreberiana* Sph., Ills. Br. Ins., Haus., IV, 81, 1834.

*Lozotaenia schreberiana* Wood, Ind. Ent., No. 875, 1839.

- Lozotaenia schreberiana* Westwd., Br. Moths, II, 114, pl. 80, p. 20, 1844.  
*Sericoris trileucana* Doubleday, Zoologist, V, p. 1729, 1847.  
*Croesia* (?) *trileucana* Sph., Cat. Br. Ins., X, 90, 1852.  
*Croesia persicana* Fitch., 3d Rept. Ins., N. Y., 357, 1856.  
*Lozotaenia schreberiana* Westwd., Br. Moths, 2d Ed., II, 114, pl. 80, p. 20, 1857.  
*Ditula* (?) *blandana* Clem., Pro. Ent. Soc. Ph., III, 515, 1864.  
*Lozotaenia fragariana* Pack., Guide St. Ins., 335, 1869.  
*Tortr.* (*Argyrot*) *conigerana* Zell., V. Z.—b. Ges. Wien, XXV, 227, 1875.  
*Ptycholoma persicana* Fern., Tr. A. E. S., X, 14, 1882.  
*Ptycholoma trileucana* Barrett, Ent. Mo. Mag., XXIV, 35, 1887.  
*Archips persicana* Fern., Bull. 52, U. S. N. M., No. 5379, 1902.  
*Archips persicana* Kearf., Smith's List, Lep., No. Am., No. 5796, 1903.

I feel considerable doubt of the correctness of the synonymy of this species. Stephens and the earlier authors give earlier references in the works of Linne (Gmelin Ed. xiii), Panzer (Fauna Insectorum Germaniae), etc., usually accompanied by interrogation marks. Doubleday, in Zoologist, 1847, says under heading of *L. schreberiana*. "This species bears no resemblance to the *Tortrix schreberiana* (Linn.), except in having a white costal spot: it is *Sericoris trileucana* (Gm.), a common American species." This remark is repeated in the second edition of Westwood's British Insects, but does not occur in the first. I have carefully examined all of the available editions of Linne, and find nothing that convinces me that either he or Gmelin were acquainted with the American species, but that all of their references were of the European species now known as *Olethreutes schreberiana* L., Staudinger & Rebel Cat. No. 1856.

If this presumption is correct, Stephens is responsible for the first notice and description of the American insect. Westwood's figures, especially good in the first edition, are undoubted representations of our common *persicana*.

***Archips biustulana* Stephens.**

- Lozotaenia biustulana* Sph., Cat. Br. Ins., II, 171, 1829.  
*Lozotaenia biustulana* Sph., Ills. Br. Ent., Haus., IV, 78, 1834.  
*Lozotaenia biustulana* Wood., Ind. Ent., No. 867, 1839.  
*Lozotaenia biustulana* Bentley, Zoologist, III, p. 1001, 1845.

- Lozotaenia biustulana* W. & H., Br. Moths II, 113, pl. 80, p. 10, 1851.  
*Lozotaenia biustulana* Sthp., List B. M., X, 90, 1852.  
*Lophoderus melaleucanus* Walk., Cat. Lep. Het. Br. Mus., XXVIII, 335, 1863.  
*Conchylis invexana* Walk., Cat. Lep. Het. Br. Mus., XXVIII, 358, 1863.  
*Ptycholoma* (?) *semifuscana* Clem., Pro. Ent. Soc. Phil., III, 519, 1864.  
*Tortrix melaleucana* Rob., Tr. Am. Ent. Soc., II, 271, pl. 4, p. 29, 1869.  
*Tortrix* (*Ptychol.*) *melaleucana* Zell., V. Z.—b. Ges. Wien, XXV, 223, 1875.  
*Ptycholoma melaleucanum* Wlsm., Ills. Lep. Het., B. M., IV, 10, pl. 62, f. 8, 1879.  
*Ptycholoma melaleucana* Fern., Tr. A. E. S., X, 14, 1882.  
*Ptycholoma biustulana* Barrett, Ent. Mo. Mag., XXIV, 35, 1887.  
*Archips melaleucana* Fern., Bull. 52, U. S. N. M., No. 5380, 1902.  
*Archips melaleucana* Kearf., Smith's List, Lep. No. Am., No. 5797, 1903.

Both Wood and Westwood's figures of this species, are very poor in execution, although they bear a resemblance to *melaleucana*; the best evidence for restoring Stephen's name, is Barrett's statement that he had compared it (Stephen's specimen) with types of *melaleucana* sent by Fernald, and that it was the same species.

#### **Pandemis obliquana** Fab. ?

- Pyrallis obliquana* Fabricius (?), III b. 257.  
*Lozotaenia obliquana* Sthp., Cat. Br. Ins., II, 171, 1829.  
*Lozotaenia obliquana* Bentley, Zoologist, III, 1001, 1845.  
*Tortrix obliquana* Haw (?)  
*Lozotaenia obliquana* Westwd. & Humph., Br. Moths II, 113, pl. LXXX, p. 8, 1851.  
*Lozotaenia obliquana* Stephens, Catal. Br. Ins. II, 171, No. 6868, 1829.  
*Lozotaenia obliquana* Stephens, Ill. Br. Ent., Haus., IV, 77, 1835.  
*Lozotaenia obliquana* Wood., Ind. Ent., No. 865, 1839.  
*Paramesia peregrinana* Stephens, List, B. M., X, 90, 1852.  
*Teras albaniana* Walk., Cat. Br. Mus., XXVIII, 288, 1863.  
*Pandemis albaniana* Wlsm., Ill. Lep. Het., B. M., IV, 11, pl. 62, f. 10, 1879.  
*Pandemis obliquana* Barrett, Ent. Mo. Mag., XXIV, 35, 1887.  
*Pandemis albaniana* Fern., Tr., A. E. S., X, 14, 1882.  
*Pandemis albaniana* Fern., Bull. 52, U. S. N. M., No. 5393, 1902.  
*Pandemis albaniana* Kearf., Smith's List, B. Am., No. 5810, 1903.

I have not seen Haworth's or Fabricius' note on this insect, — it is probable the latter did not have an American specimen before him, but I have little doubt that Stephens described and

Westwood figured the species that we have known as *albani-ana* Walk., so that *obliquana* will replace this name, although some doubt remains as to whether the author is Fabricius or Stephens.

In addition to the four species above, for which we are entirely indebted to Mr. Barrett, for straightening out the synonymy, I make record of the following notes on other possibly overlooked names of American Tortricids, so that we may have a reference something less than a century old.

From the English translation of Linne, entitled,

SYSTEMA NATURAE by Sir CHAS. LINNE, AMENDED and ENLARGED by the IMPROVEMENT and DISCOVERIES of LATTER NATURALISTS and SOCIETIES. By WILLIAM TURTON, M. D. Vol. III, London 1802.

The Section heading on page 342 is:—

"*Pyralis*. Tortrix of Gmelin."

- P. 345. *Lactana*. Wing cinereous; upper pair with scattered black dots. Inhabits *Georgia*.

*Body* small snowy; *lower wings* snowy with a small black mark at the hind margin.

- P. 348. *Margana*. Wings chestnut-brown, with a yellow outer margin in which are 2 chestnut-brown bands.

Inhabits *American Islands*.

*Head* and *thorax* variegated; *breast* and *legs* snowy; *upper wings* with a small ring in the middle, angle of the tail brownish.

- P. 348. *Triangulana*. Wings varied yellow and brown with a yellow base and marginal spots.

Inhabits *American Islands*.

*Lower wings* cinereous.

- P. 351. *Badierana*. Wings yellowish with two white waved streaks. Inhabits *American Islands*.

*Lower wings* whitish.

- P. 352. *Criscana*. Wings grey-brown, the tip darker with a white marginal spot.

Inhabits *American Islands*.

*Wings* terminating in a white streak.

- P. 356. *Sulphurana*. Wings yellow with two indented oblique brown streaks and numerous flecks.

Inhabits *North America*.

*Body* yellow; *abdomen* white; *lower wings* snowy; beneath all white.

The first five descriptions do not, at present suggest to me any of our known species; by "American Islands," I assume the West Indies are meant, although Walsingham seems to have entirely overlooked these species in his two papers on West Indian Micro-Lepidoptera. The last is certainly a perfect, condensed description of *sulfureana* Clemens, and unless further evidence is forthcoming to prove the contrary, Dr. Turton or Fabricius will succeed. Clemens as the author, but fortunately, with little change in name. Incidentally, it may be worth while for students in the Macro-Lepidoptera as well as in the lower Tineids to consult this work, as American references are not restricted to the Tortricids.

Mr. A. Busck is responsible for the following change of name, and I am indebted to him for calling my attention to the error of Walker, which he discovered, while examining Walker's American types in the British Museum.

***Platynota idæusalis* Walker.**

*Hypena* (?) *idaeusalis* Walk., Cat. Br. Mus., XIX, 839, 1859.

*Platynota sentana* Clem., Pr. A. N. Sci. Ph., 348, 1860.

*Tortrix sentana* Rob., Tr. Am. Ent. Soc. II, 277, 1869.

*Tortr.* (*Platyn.*) *sentana* Zell., V. Z.—b. Ges. Wien., XXV, 235, 1875.

*Bomolocha idæusalis* Dyar., Bull. 52, U. S. N. M., No. 3078, 1902.

*Platynota sentana* Fern., Bull. 52, U. S. N. M., No. 5387, 1902.

*Bomolocha idæusalis* Smith, Smith's List, Lep. No. Am., No. 3310, 1903.

*Platynota sentana* Kearf., Smith's List, Lep. No. Am., No. 5804, 1903.

Prof. Smith suspected this species to belong to the Tortricidae as evidenced by foot-note on page 60 of his 1903 list.

In Syst. Eleotheratorum, Tornus I, page 138, 1801, Fabricius uses the generic name *Platynotus*, as a genus in Coleoptera; whether this invalidates Clemens' *Platynota* I prefer to leave to others, more skilled in generic nomenclature.

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SATYRUS PEGALA.—Mr. Holland gives in his butterfly book on plate xxvi a picture of the female with two eye-spots. Finding that there are few flies with two eye-spots I caught a pair in coition and discovered that there are two kinds of females. One with two eye-spots and the other with one spot in the primaries. The latter one is more abundant. This insect is hard to catch, flying in zig-zag and alighting on trees.—CHAS. FAUST, Magnolia Springs, Baldwin Co., Ala.



## Notes on the Life-Histories of Certain Wood-Boring Lepidoptera.

BY FRANCIS X. WILLIAMS, San Francisco, Cal.

(Plate IV.)

### **Vespamina sequoiæ** Hy. Edwards.

In the Monterey pine forests at Carmel, Monterey Co., Cal., this insect was quite plentiful. Usually the resinous masses beneath which the larvæ dwelt were not above the reach of the hand, and I think it quite probable that the insect takes advantage, as often as it may, of a wound in a pine trunk as a nidus in which to oviposit. Those nodules in or under which there are larvæ are of soft consistency and exude resin; those containing pupæ in their silk-lined tubes, or larvæ about to pupate, may be known by their duller color, more generally even surface, and by the fact that the pitch has ceased to flow and the mass is somewhat hardened. As far as my observations go there is but one insect to a nodule, except sometimes in those cases where an old mass of resin of considerable size has been utilized by two. The adult has quite an extended season; pupæ have been sent me at the end of March, 1908; the preceding year in May I reared a male; during June, 1908, I secured several more specimens; and finally two emerged during September of the same year. Like most other borers, the pupæ, unless almost on the point of disclosing moths, will dry up and die if taken out of their chambers.

### **Sesia mellinipennis** Boisduval.

This is a common Californian "Clear-wing," somewhat variable in markings and enjoying a wide range. The writer, while examining a large decumbent trunk of *Ceanothus thyrsiflorus* in a canon a few miles south of Carmel, in June, 1908, found the larvæ and a pupa of this insect, the former boring into the solid wood, the latter under the bark in a pupal chamber of particles of wood fastened together with silk. A section of the infested trunk was sawed off and taken to San Francisco, where in August I was rewarded with three fine moths.

**Sesia polygoni** Hy. Edwards.

This pretty little red sesian is the only one I have found in San Francisco, and until this season has been considered quite rare here. Formerly I used to take two or three adults per season, but this year the discovery of its larval food-plant yielded me a fair series of imagines. On the 7th of July, while hunting Lepidoptera a few miles south of San Francisco, in the Lake Merced region, I noticed a male *S. polygoni* rise heavily from a *Polygonum paronychia*, a prostrate perennial which forms a carpet over the sandy soil in which it grows. I netted this freshly hatched moth, and upon examining the plant found its crown badly infested with a borer, which proved to be *polygoni*. However, the season for adults was rather past and but one or two larvæ and pupæ were procured here. On examining other *Polygonum* plants I found them very generally infested. A majority of the moths had already emerged, but I found quite a number of pupæ and some larvæ. An infested plant was readily detected by the quantity of pale reddish brown frass about the base, and frequently by its sickly appearance. Large plants sometimes contain two larvæ apiece.

The larva (Fig. 3) is quite slender; head brown; body dull dirty white, dorsal line dark, cervical shield weak, pale brown. Length of mature larva about 17 mm. The arrangement of the hairs and plates is shown in Figs. 4 and 5.

The pupa is rather slender, pale brownish, with the more heavily chitinized portions darker, and as in other members of this family is armed with abdominal rows of spines and a pointed process over the head. Length 12 mm., width 3 mm.

As the smaller stems of *Polygonum* frequently contain smaller mines (see Fig. 1, upper portion), it is probable that the larvæ first work their way downwards, often boring far down into the main root. Deserted galleries are found to be filled up with frass; this is probably done in a great measure when the larva prepares its pupal chamber. This is usually of considerable length, the longest measured is illustrated in Fig. 1 and is 55 mm. long. Others measured were 54, 53, 50, 45, 45, 41 and 35 mm. respectively. Small stems containing

borings were mere shells. The pupal chamber, which is slightly wider than the pupa, is frequently curved, and extends underground for its greater length; its lower end is usually the filled-up continuation of a gallery. The chamber is well lined with silk, and its upper end connecting with the exterior is closed with bits of frass, etc., secured together with silk. All the enlargements of this tube are carefully filled in.

I obtained from larvæ and pupæ about 20 imagines, which emerged from July 8th to July 20th. Like *Vespa minima sequoiae* and other sesians, *polygoni* has a long season, and larvæ of various sizes (though the majority of them well grown) were found in July and August.

This pretty little species is beautifully illustrated in Beutenmuller's "Monograph of the Sesiidæ of North America North of Mexico." The insect was described by Hy. Edwards ("Papilio," Vol. I, p. 202, 1881) from 1 male taken on *Polygonum maritimum*, San Miguel, Cal.

***Pterophorus baccharides* Grinnell.**

This large pale-colored plume-moth has been recently described by Mr. Fordyce Grinnell, Jr. (*Canadian Entomologist*, Vol. XL, pp. 317-318, 1908) from specimens reared by me from the stems of *Baccharis pilularis* in San Francisco.

The insect is quite common here as well as at Stanford University and at Carmel in Monterey Co., and probably has a wide coast distribution. The wood-boring habit of the larva is interesting, but not unique among the Pterophoridae.

Description of a nearly mature larva (fig. 12).—Head pale brown, darker about the mouth and along the sides, clypeus not reaching half way to vertex. Body of uniform thickness, somewhat depressed, shining white, with slight creamy yellow tinge ventrad; cervical shield strong, pale brownish, with two transverse patches of small dark brownish tubercles, interspersed rather sparsely with hairs, the first patch the narrower. On the second and penultimate segments is a less developed patch. On each side of the dorsal line an irregular, rather broad and broken purple line; subdorsal a heavier, wider purple band; and below the brownish spiracles an indistinct geminate line of the same color, with an extended blotch just cephalad of each spiracle. Indications of another line below lateral fold. Body with sparse brownish hairs, ex-

cept on last segment where the heavily chitinized, dark brown anal plate is widely bordered with numerous dark hairs arising from small tubercles. This plate (fig. ) which occupies obliquely half the segment contains a raised disc somewhat below its middle, bearing a pair of slightly upcurved chitinized processes. On this plate between and below the prongs are rough granulations. Feet dull white, with pale brown blotches; prolegs dull white, crochets semicircular. Length of mature larva 16 mm., width (at seg. 6) 2.75 mm.

Described from fresh specimens, measurements from alcoholic material.

*Pupa*.—Slender, cylindrical, slightly narrowest above middle, color pale yellowish brown, darker at base of abdominal segments, and very dark brown at the obliquely truncate cephalic end, which is heavily armed with numerous little spines. Of these, there is a strong ridge of large ones at the base of each antenna above, and a smaller group on each shoulder. Brown hairs especially along dorsal edge of this area and on thorax and abdomen. On lower dorsal border of segments 4, 5 and 6 of abdomen is a row of spines pointing obliquely cephalad, and on the remaining segments is a row pointing obliquely caudad. Somewhat below the lateral line of each of the spiny segments are other spines arranged in a row, on segments 4, 5, and 6 few, on the remaining segments becoming more numerous. Fused leg and wing tips free from body. Length 15-18 mm., width at thorax 2.80 mm.

Described from alcoholic specimens.

The larva bores a smooth cylindrical passage in the stem of *Baccharis pilularis*, and the oblique opening can be readily detected by the quantity of pale-colored frass on the ground below. The galleries may be in the smaller stems or in the main trunk and at least partly above ground. On tall shrubs the caterpillar may be found working high up in the stems. Several parallel passages often occur in one stem, and are usually quite straight and almost invariably open on the under side of the branch.

The pupa, which is very active, lies some distance from the bottom of the gallery, but may move considerably therein. The pupal chamber is not silk-lined. A short search in winter revealed no pupæ of this insect, but half-grown and nearly mature larvæ were plentiful. The larval period, while not determined, must be of at least a year's duration. Adults were

common in June and in September. The cocoons of a hymenopterous parasite were found in two galleries, but no adults have as yet been secured.

#### EXPLANATION OF PLATE V.

- Fig. 1.—Pupa of *Sesia polygoni*.  
Fig. 2.—Pupal chamber of *S. polygoni* in stem of *Polygonum paronychia*.  
Fig. 3.—Sixth segment of larva of *S. polygoni*.  
Fig. 4.—Extruded pupal shell of *S. polygoni*.  
Fig. 5.—First two segments of larva of *S. polygoni*.  
Fig. 6.—Larva of *S. polygoni*.  
Fig. 7.—Pupa of *Pterophorus baccharides*.  
Fig. 8.—Caudal extremity of larva of *P. baccharides* showing anal plate.  
Fig. 9.—Seventh segment of larva of *P. baccharides*.  
Fig. 10.—Nearly mature larva of *P. baccharides*.  
Fig. 11.—First two segments of larva of *P. baccharides*.  
Fig. 12.—Pupal chamber of *P. baccharides*.

All figures except 2, 4 and 12 more or less enlarged; figs. 2, 4 and 12 about natural size.

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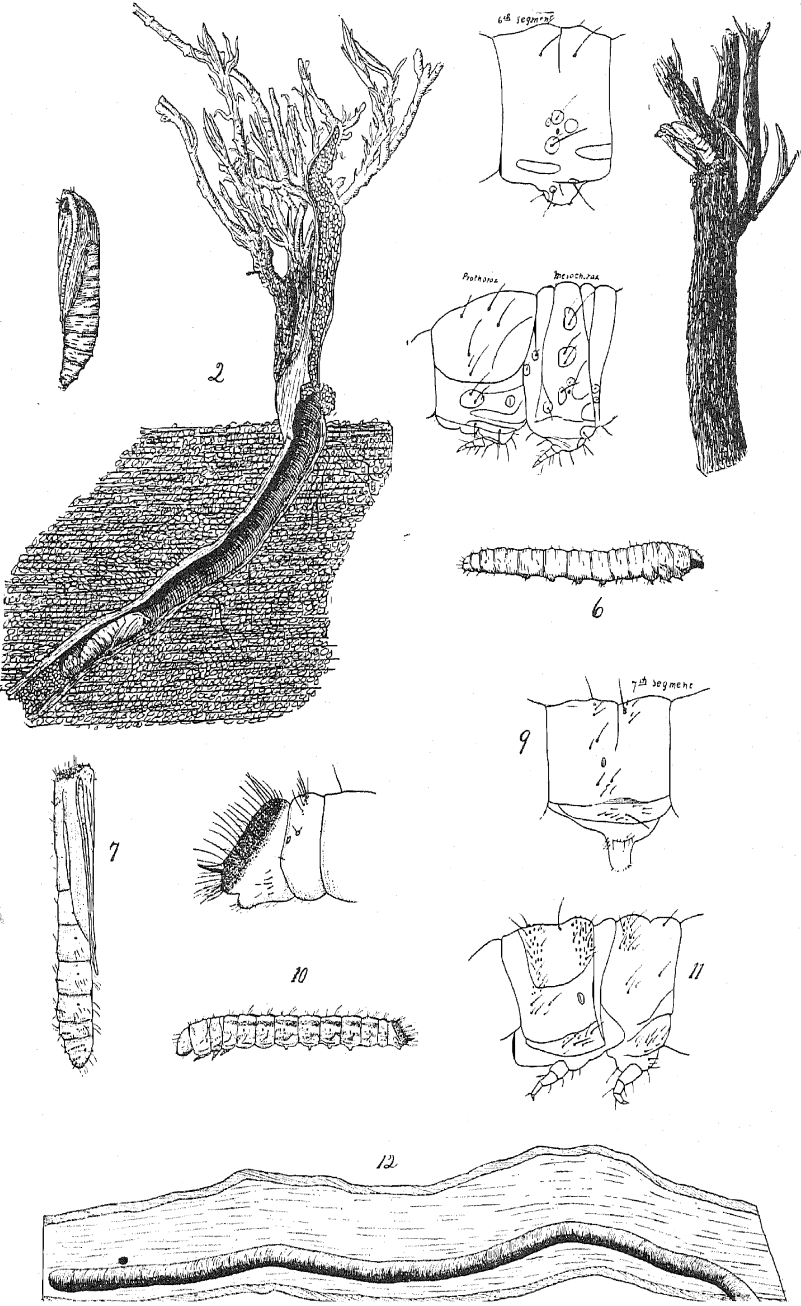
### The Butterflies and some of the Moths of the Mt. Shasta Region.\*

By FRANCIS X. WILLIAMS, San Francisco, Cal.

The writer spent a portion of the summers of 1901, 1902, 1903 and 1907 near the little town of Castella, on the banks of the Upper Sacramento River, in the northwest portion of Shasta County. During the summer of 1901, few insects were captured and none preserved, as the writer did not then possess the "mania" for catching butterflies which he now has. In 1902, however, some real collecting was done, while in June and July of 1903, which was by far the best of the four seasons, a large number of species were taken. Although nearly two months of the summer of 1907 were spent in assiduously collecting Lepidoptera, fewer specimens were taken than in my shorter stay in 1903. This was probably due to the fact

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\*The Sphingidae, Saturniidae, Arctiidae, Sesiidae and Hepialidae are given in full, other families of Heterocera represented in region under consideration are incompletely listed or omitted.





that in 1907 the summer was initiated by severe rain showers while the whole summer was exceptionally cool.

Headquarters were established near Castella, only eight or nine miles south of Upper Soda Springs in Siskiyou County, where Henry Edwards and James Behrens collected Lepidoptera for many seasons.

From Castella several expeditions of from 13 to 25 miles into the mountains were made, and it was a pleasure indeed to leave the valley when butterflies were becoming ragged and warm to capture fresh and perfect specimens in the mountain meadows, which, barring Culicidae, are a source of delight to the entomologist.

In the vicinity of Castella the steep wooded mountains draw close together and the valley becomes canon-like, so that in early summer insects alpine in habits are often found in the valley, which is here about 1,900 feet above the sea level.

On the east side of the Sacramento is a range of mountains from 4000 to 6000 ft. high, beyond which is the McCloud River, and on the west are the higher Trinity Mountains rising over 7000 ft. in several places, and terminating northward in Mt. Eddy, 9,151 ft. high. This range is the dividing line of Shasta and Trinity Counties, and is studded with small but beautiful glacial lakes, always in a protected hollow on the north slope of some rocky peak, and fed by its melting snows. Such lakes visited were Echo Lake, the principal source of Castle Creek, and situated at the base of the sharply conical Tamarack peak 7000 ft. high; Gumboot, Bluff, Picayune and Castle Lakes, the first three in Trinity and the last in Siskiyou County; and finally, three unnamed lakes in the former county, and giving rise to the east fork of the Trinity River flowing westward to join the Klamath near the ocean. A trip was made to Sisson to the north, and two to the swift blue McCloud River, from different points. Needless to say, all these localities furnished a number of interesting Lepidoptera.

C. Hart Merriam has made a careful study of the life zones represented on Mt. Shasta (see N. A. Fauna No. 16, U. S.



Dept. Agric. Div. Biol. Survey, 1899), and what he says of the zones there can as well be applied to the region about Castella, only 21 miles south of the mountain.

The Transition zone embraces the whole country about Mt. Shasta, except Shasta Valley to the northward (which is diluted Upper Sonoran), and fills the McCloud and Pitt River Valley to the south and reaching into the mountains to an altitude of 5000 or 6000 ft. It consists chiefly of coniferous forests, which in the lower and more arid regions, are composed of *Pinus ponderosa* interspersed with other conifers, as *Pseudotsuga mucronata* and *Libocedrus decurrens*, which, however, grow in moister places than the yellow pine and extend higher into the mountains. The black oak (*Quercus californica*) is found with *P. ponderosa*, *Taxus brevifolia* occurs along the river edges, while the sugar pine (*Pinus lambertiana*), *Abies concolor lowiana* are abundant about the middle or upper portions of the zone. Only one grove of *B. attenuata* was seen. The white fir (*Chamaecyparis lawsoniana*) occurs in moist groves as far up as the Canadian zone.

This is a less extensive zone than the first and characterized by forests of smaller conifers, etc. Restricted to this zone, which has a vertical height of about 2500 ft., is the Tamarack or lodge-pole pine (*Pinus murrayana*), the White Mountain pine (*Pinus monticola*), and the Shasta fir (*Abies shastensis*). Among the shrubs *Quercus vaccinifolia* and *Arctostaphylos uvaursi*, both low spreading plants, were noted as belonging here. A *Rhododendron* with rose-tinged flowers was common in this zone growing along the lake margins and small creeks. The marshy mountain meadows form conspicuous green patches, often of large extent at one or both ends of the lakes, while dryer and more exposed portions of this zone have a more or less open growth of chaparral, with here and there a clearing, often carpeted with polygonaceous and other flowers.

The Hudsonian zone was noted in the Trinity Mountains as small groves of alpine hemlock (*Tsuga mertensiana*) growing on the cool shaded sides of the highest ridges, at an altitude

of about 7000 ft. In the middle of July, 1907, many of these stunted and bent little conifers were still standing in two or three feet of snow, while on the south exposure of the same ridges one finds himself in barren or chaparral portions of the Canadian.

Although plants characterize the zones better perhaps than do insects, yet a number of butterflies and some moths seemed quite restricted as regards their range. The Transition zone which contained the largest number of species was found to be characterized in its lower portion by *Melitaea chalcon* and *leanira*. *Carterocephalus palaemon*, *Pamphila agricola*, *pratincola*, *vestris* and *comma* seemed strict residents of the Lower Transition, with *Anosia plexippus*, *Argynnis zerene* and *monticola*, *Heterochroa bredowi*, *Thecla nelsoni*, *Chrysophanus gorgon* and *Papilio rutulus* seldom out of it. *Papilio daunus* by the way, always kept to the valley. Among the moths of the Lower Transition were *Pholus achemon*, *Phlegathontius quinque-maculata* (*celeus*), *Sphinx oreodaphne* and *sequoiae*, *Telea polyphemus*, *Saturnia mendocino*, *Sesia mellinipennis*, *rutilans* and *behrensii*.

The "sooty gossamer-wing" (*Satyrrium fuliginosa*) was confined to the chaparral growth of the Upper Transition.

*Melitaea hoffmani*, *Chrysophanus zeroe* and *mariposa*, a *Lycaena* allied to *behrii*, and *Lycaena podarce* were not observed outside of the Canadian zone. *L. podarce*, always found in the meadows, is a very good criterion of this life area.

The very limited Hudsonian had no butterflies peculiar to it, though *Chionobas nevadensis* was more common there than elsewhere.

A large number of species of butterflies and moths can be found from the Lower Transition into the Canadian, but these are usually more common in some particular portion of one zone.

A difficulty which the entomologist is apt to encounter in tracing out the zonal ranges of certain insects, if his hunting grounds are in a mountainous country and he arrive there in

midsummer or late summer, is that the insects which he sees at high altitudes and appearing peculiar to that level, may in late spring or early summer frequent the valley region as well.

This is true of *Melitaea palla* which practically disappears in the valley before July, but only commences to come out in the mountains in the Canadian zone when that month is well initiated. *L. saepiolus* usually a resident of the Canadian, occurs sparingly in the valley at an early date. *L. fulla* and *sagittigera*, earlier in the valley were usually much later in the mountains. *Parnassius clodius* was seen on several occasions at 1900 ft. in June, but were just emerging at an altitude of 6000 ft. July 10. The June specimens must have emerged in the valley region, since there were none in the mountains at that date. Among the moths, *Sphinx perelegans* comes out about one month later at Echo Lake, altitude about 6500 ft., than it does in the valley, elevation 1900 ft. *Alypia langtoni* likewise is early in the valley and late in the mountains. The exquisite little *Gyros muirii* was in fine condition at Echo Lake on July 10, 1907. On June 12, 1903 a hardly recognizable specimen of this species was taken in the Castle Creek Canon, at an elevation of 2000 ft.

#### PAPILIONOIDEA.

1. *Anosia plexippus* Linn.—Quite common in 1907 in the valley where milkweed was abundant. A specimen from Echo Lake is quite a good deal darker in color than valley examples.

2. *Argynnis leto* Behr.—Rare at Castella, but not uncommon at Sisson further north.

3. *Argynnis oweni* Edw.—Not rare in the mountain meadows in July and August, flying also in the uppermost Transition in the more treeless areas. This is strictly a mountain form; the type locality of the species is Mt. Shasta, elevation 7,500 ft. (Owen).

4. *Argynnis zerene* Bdv.—The most common "fritillary" of the region, and confined chiefly to the valley where it flies with the following species.

5. *Argynnis monticola* Behr.—Quite common, the larger var. *purpurascens* Hy. Edw. rarer. *Zerene* and *monticola* were just putting into appearance when my brother and I reached Castella at the end of June in 1907. The males come out earlier than the females, and both sexes are very fond of feeding at the flowers of *Apocynum androsaemifolium* var. *pumilum*, a small plant common by the roadside. The

blossoms of these plants fail before the summer is past, and the *Argynnis* are then contented with the late-blooming *monardellas*. Early in August female *monticola* and *serene* could be seen flying about the hills in a faded condition, once in a while alighting among the dead leaves to oviposit. There is considerable doubt as to whether *A. monticola* and *serene* are really two distinct species.

6. *Argynnis coronis* Behr.—But a single female example captured. A few others seen near the McCloud River.

7. *Argynnis rupestris* Behr.—Not a common insect; in the valley.

8. *Argynnis epithore* Bdv.—Quite common in the Canadian zone, especially about the meadows. Occurs sparingly and earlier in the valley.

9. *Melitaea chalcodon* Db. and Hew.—Very abundant in the valley region in June and early July. Numbers of these insects congregated about moist sandy spots along the McCloud River where they could be picked up with forceps. The yellow bands on the under side of the wings of *Shasta chalcodon* average distinctly paler than in specimens taken about San Francisco. A small colony of *Melitaea* larvae found aestivating under a board on August 9th probably belonged to this species.

10. *Melitaea palla* Bdv.—This very variable species was taken both at high and low altitudes. Male specimens from the Shasta Canadian zone are much blacker basally than males from the San Francisco bay region. The females may be "foxy red to blackish with all intergrades." This was noted by Hy. Edwards, Behr and probably by others, and the specimens described by Wright in his "Butterflies of the West Coast" as *eremita* n. sp. is the dark form of females, which occurs both in northern and central California.

11. *Melitaea hoffmani* Behr.—Rather rare and taken in the mountain meadows.

12. *Melitaea leanira* Bdv.—Not plentiful and always in the valley region.

13. *Phyciodes pratensis* Behr.—Fairly abundant; usually in the Transition, but also found in the Canadian Zone.

14. *Phyciodes mylitta* Edw.—Rather common; Echo Lake specimens taken at an altitude of 6,600 ft. are quite dark.

15. *Grapta satyrus* Edw.—The commonest *Grapta* of the region, but not plentiful at that.

16. *Grapta faunus* Edw.—Rare.

17. *Grapta zephyrus* Edw.—Rather rare. A worn specimen taken at Echo Lake, July 12, 1907, may have hibernated. Larva on *Rhododendron*.

18. *Vanessa antiopa* Linn.—Common enough and unrestricted in its range.

19. *Vanessa californica* Bdv.—Fairly swarming in June and July, 1902, but rare in 1907. This species is noted for its erratic movements,

20. *Pyrameis caryae* Hbn.—Noted at Echo Lake, July, 1907.
21. *Pyrameis cardui* Linn.—Noted at Echo Lake, July, 1907.
22. *Junonia coenia* Hbn.—A common insect of the lower levels.
23. *Limenitis lorquini* Bdv.—Quite common, especially in the valley.
24. *Heterochroa bredowii* Hbn.—Rather abundant.
25. *Coenonympha brenda* Edw.—Specimens from Shasta County correspond to *brenda*, as illustrated in Wright's book, but do not agree so well with Edwards' description of the species. Common in August in grassy localities in the valley.
26. *Satyrus ariane* Bdv.—Common in July about wooded hillsides. There is much variation in my series of the species, but they all seem referable to *ariane*.
27. *Satyrus silvestris* Edw.—Commoner perhaps than the preceding species and usually occurring at higher elevations. *Silvestris* has a curious habit of alighting on pine trunks, out of the reach of a net.
28. *Chionobas nevadensis* Feld.—This is the same as Boisduval's *californica*, which he reports as occurring on high mountains at the snow line. I took *nevadensis* in the Upper Canadian and in the Hudsonian Zone about Echo Lake at the end of July in 1902, when it was not uncommon. No trace of it was seen in 1907, however. It is not an easy insect to capture, and it is with difficulty that it can be "scooped off" the boulders on which it sits, all on the alert.
29. *Thecla grumus* Bdv.—Common, especially about *Quercus chrysolepis*. Taken in the Canadian Zone, but more plentiful at lower levels.
30. *Thecla halesus* Cram.—This gorgeous insect was taken only twice; in the valley region in June, 1903. It is essentially a southern species, but is probably well established in Shasta County, where its food plant—mistletoe—occurs on the black oak.
31. *Thecla m-album* Bd. & Lec.—A single worn female, June, 1903. Boisduval in his "Lépidoptères de la Californie" reports it from the extreme southern portion of California.
32. *Thecla melinus* Hbn.—Rather rare; in the valley.
33. *Thecla californica* Edw.—Quite plentiful along the stream margins. A number of pupae shells girdled to the underside of stones in the vicinity of willows probably belonged to this species.
34. *Thecla saepium* Bdv.—A very common insect along the Sacramento River in July, where it frequents the blossoms of a species of *Clematis*.
35. *Thecla nelsoni* Bdv.—Not very plentiful and coming out rather early in summer. In the valley in June.
36. *Thecla iroides* Bdv.—Common and widespread.
37. *Thecla eryphon* Bdv.—But two specimens taken; one rather fresh, female, in the pine woods in early July, 1903, and a faded female captured on alpine hemlock, Echo Lake, July 12, 1907. This insect also occurs in southern California. I have seen a specimen from Monterey and have taken it on Mt. Tamalpais in Marin County.

38. *Thecla dumetorum* Bdv.—Not rare, especially in open stony places in the Canadian Zone. Have found the larva on a species of *Eriogonum* in San Francisco. While my female specimens from the latter locality have at most an obscure bronze tinge, those taken at Echo Lake are very bronzy.

39. *Chrysophanus virginienis* Edw.—A common "copper" along the banks of the McCloud River at the end of July, 1907, and occurring also high up the Castle Creek Canon in July and August of the same year.

40. *Chrysophanus gorgon* Bdv.—Partial to the more open dry spots along Castle Creek, the Sacramento River, where *Eriogonum* abounded. The females vary much in intensity of markings. Commonest in July, 1903.

41. *Chrysophanus mariposa* Reak.—Never abundant and always well in the Canadian Zone, where they are in season at the end of July.

42. *Chrysophanus zeroe* Bdv.—Likewise a mountain species and somewhat rarer than the preceding. Several males and females taken at the end of July.

43. *Chrysophanus helloides* Bdv.—Fairly plentiful in the valley.

44. *Satyrium fuliginosa* Edw.—Peculiar to the Upper Transition, and flying about chaparral. The flight is swift and much like that of a Theclid. Almost all my specimens of *fuliginosa* were caught in July, 1903, about the base of the Gray Rocks on the south side of Castle Creek.

45. *Lycaena heteronea* Bdv.—Rather common and often in company with *C. gorgon*. Its food plant is probably also *Eriogonum*. Sometimes taken in the Upper Transition. The females vary somewhat in color and have the wings sometimes shot with blue. Common in July.

46. *Lycaena fulla* Edw.—Rather common in early summer in the valley, later in the mountains.

47. *Lycaena saepiolus* Bdv.—Likewise found in the valley in June, but its real habitat is the Canadian meadows, where it is abundant enough in the latter part of July. In the Shasta region the females are not in the least blue, being dusky, with a more or less distinct fulvous band on the upper side of the secondaries, often with a trace of the same on the primaries.

48. *Lycaena behrri* Edw.—Only taken at Echo Lake in the Canadian Zone, June 22, 1903, and July 12, 1907. I have called this insect *behrri* not being able to place it elsewhere. It differs from the typical *behrri* as described by Edwards, and which is common about San Francisco bay in March and April. This latter insect has the underside of both wings dark brownish gray and the female on the upperside is almost entirely fuscous. In the male the color on the upperside is "glossy lilac-blue," with the hind margins of both wings fuscous. In the specimens from Echo Lake, the male lacks the lilac tinge and the margins are

more narrowly dusky, while the underside in both sexes is of a pale gray color, the pupilled spots are smaller than in typical *behrii*, with those of the secondaries usually proportionally smaller. The female is shot with blue on the upperside to the outer three-fourths or more. It appears more nearly related to the southern *polyphemus*. A specimen from Mt. Diablo much resembles those from Shasta.

49. *Lycaena sagittigera* Feld.—A rather rare insect, most frequently seen about Echo Lake in July, 1907.

50. *Lycaena podarce* Feld.—Confined to the Canadian meadows, where it is quite plentiful and can be readily bottled from the flowers during cloudy weather. It is on the wing somewhat earlier than *saepiolus*.

51. *Lycaena enoptes* Bdv.—Some of the males of this species have some orange at the anal angle of the secondaries, but most lack it. The females are all fuscous, with a more or less distinct orange band on the secondaries. There is much variation in size in *enoptes*, and they do not resemble the *enoptes* figured in Wright's book. I have found the species both in the Canadian and Lower Transition Zones in the Shasta region.

52. *Lycaena anna* Edw.—Rather common and always in moist weedy localities, perhaps commonest in elevated regions.

53. *Lycaena acmon* Db. & Hew.—Common and occurring at all elevations visited. This species varies much in size and intensity of coloration. My smallest male, from the McCloud River, expands 17.5 mm., while my largest female, from the Canadian Zone of the Trinity Mountains, has an alar expanse of 31 mm. My females from the Shasta region are all of the brownish variety, with very little suffusion of blue. Two males from Echo Lake have the marginal fuscous band wider than ordinary. I have reared adults from larvae feeding on *Eriogonum* and *Hosakia*.

54. *Lycaena piasus* Bdv.—A very common insect and the "blue" most frequently seen congregated about moist spots. At all elevations.

55. *Lycaena comyntas* Godt.—Common in the valley in July.

56. *Lycaena amytula* Bdv.—Likewise in the valley, but rarer than the preceding species.

57. *Neophasia menapia* Feld.—Common in the coniferous forests and not often descending into the valley.

58. *Pieris sisymbri* Bdv.—Only taken about Echo Lake in July. Its habitat appears to be in the mountains.

59. *Pieris occidentalis* Reak.—In the valley; rare.

60. *Anthocharis lanceolata* Bdv.—An early butterfly, and only seen in the valley, where its food-plant, *Sisymbrium officinale*, grew. Several faded examples of this butterfly were taken early in June, 1903; and in early July, 1907, some belated larvae were found. Two perfect examples secured from overwintering pupae emerged in May and June, 1908.

61. *Anthocharis creusa* Db. & Hew.—Found with *P. sisymbri*, but rarer.

62. *Anthocharis sara* Bdv.—1 male taken in 1903.

63. *Colias eurytheme* Bdv.—Common and at all elevations. The albino females plentiful.

64. *Colias chrysomelas* Hy. Edw.—Rather rare, especially so in 1907. In the valley and canons in July.

65. *Parnassius clodius*, Men.—A common insect at proper elevations. In the mountains in July.

66. *Parnassius smintheus* var. *hermodur* Hy. Edw.—Perhaps rarer than the preceding, with which it flies in the Canadian Zone.

67. *Papilio philenor* Linn.—None taken, but several old specimens observed about Castella. Not rare in lower Shasta County on the flowers of buckeye (*Aesculus californica*).

68. *Papilio zolicaon* Bdv.—Rather common, except in 1907. Both red and yellow banded larvae of this species were noticed. Found most commonly on mountain summits. Shasta specimens appear finer than those from the San Francisco bay region.

69. *Papilio indra* Reak.—A rare and rather early insect, taken on the Sacramento and McCloud Rivers. There is some variation in the length of the tails in this *Papilio*.

70. *Papilio eurymedon* Bdv.—A common insect in the valley and on the mountains. The larva of this species was found feeding on *Rhamnus californica* and two species of *Ceanothus*. The larva of this and of the following two species, when about to pupate, change from green to chocolate-brown. *Eurymedon* pupae may be brown or greenish in color. A female reared from a larva emerged April 29, 1908.

71. *Papilio rutulus* Bdv.—Commoner than the preceding species and usually restricted to the valley region. On a moist sandy spot on the banks of the McCloud River, *Papilio rutulus* and *eurymedon* congregated in numbers, in company with numerous *M. chalcedon*, *L. piasus* and others. A single stroke of the net bagged a number of the swallowtails. The imperfect specimens were killed and arranged on the sand and boulders with the effect of attracting other Papilios, flying downstream. These, pausing to view their slaughtered brethren, were readily captured, and thus a fine series of perfect specimens, all males, were taken.

72. *Papilio daunus* Bdv.—This fine insect was found to be rather solitary in its habits and difficult to capture, especially in first-class condition. It is partially double-brooded, the spring adults appearing in May and June, and the summer ones in late July and early August. At the end of June both young and mature larvae of *daunus* were observed feeding on *Cerasus demissa*. Several imagines were reared from these larvae and emerged in early August, while other pupae hibernated. The larva is much larger than that of *eurymedon*, being



lighter green, often with a yellowish tinge, and attaining a length of about 2 inches.

73. *Carterocephalus palaemon* Pall.—Rare; in the valley in June.

74. *Pamphila juba* var. *viridis* Edw.—One female at Dunsmuir, August 6, 1907; one female, Echo Lake, July 12, 1907.

75. *Pamphila comma* Linn.—A few males on the McCloud River in July, 1907.

76. *Pamphila agricola* Bdv.\*—Rather common in the valley and often associated with the following species.

77. *Pamphila pratincola* Bdv.\*—Common.

78. *Pamphila siris* Edw.\*—Not uncommon in the valley and often associated with *vestris*. In June and July in the Transition Zone. One male, Trinity County, 6,000 ft., August 15, 1907.

79. *Pamphila vestris* Bdv.\*—Not rare in marshy spots, on mountain sides at low altitude, and in similar situations in the valley. Fresh in June.

80. *Amblyscirtes vialis* Edw.—Rare, only two specimens taken. It is not, so far as I am aware, supposed to be Californian.

81. *Pyrigus tessellata* Scudd.—A common insect.

82. *Pyrigus caespitalis* Bdv.—Rarer; usually more abundant in the mountains.

83. *Thanaos persius* Scudd.\*—Quite common at all altitudes. It is fond of frequenting moist situations.

84. *Thanaos propertius* Lint.—Common, with about the same distribution as the preceding species.

85. *Eudamus pylades* Scudd.—Rather rare.

86. *Eudamus aemilea* Skinner.—Three males and one female, Echo Lake, July 12, 1907. It is a rare and wily species here.

87. *Eudamus tityrus* Fabr.—Not uncommon, especially in the valley. One fine male obtained from an overwintering pupa emerged May 21, 1908.

#### HETEROCERA.

1. *Hemaris thetis* Bdv.—Rare in Shasta County, where a few specimens were taken feeding at *Asclepias* blossoms.

2. *Lepisesia clarkiae* Bdv.—Quite common in the valley in early June, 1903, feeding at the flowers of *Brodiaea*, *Rhododendron* and *Asclepias*. The insect (which flies shortly before noon until late afternoon) is evidently in full season in May, but flies in March in Marin County. Specimens from the latter place are much more difficult to capture than the Shasta specimens, which average smaller in size and are of a greener color. The eggs are laid upon the leaves of *Clarkia*, *Godetia* and *Epilobium* sp. The larva, which has no anal horn, is pale greenish in the first three instars and brownish in the last, being darkest on

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\* Identified by Dr. Henry Skinner.

the dorsum to the subdorsal line; the stigmata are in subtriangular blackish areas. The pupa has no protruding tongue case.

3. *Deilephila chamoenerii* Harris. I saw a fine specimen of this sphinx caught by Mr. J. E. Cottle near Castella in 1903.

4. *Deilephila lineata* Fabr.—A very common hawk-moth here, both in the valley and in the mountains.

5. *Pholus achemon* Dru.—Quite abundant in July. Taken at the flowers of *Oenothera* and *Rhododendron*. Larva on wild grape.

6. *Phlegethontius quinquemaculata* Haw.—Moderately common and feeding at the flowers of *Oenothera*.

7. *Sphinx drupiferarum* S. & A.—Rare; only a few worn specimens taken. In June in the valley.

8. *Sphinx perelegans* Hy. Edw.—Fairly abundant, coming out very much later in the season in the mountains than in the valley. Taken at *Rhododendron* and *Oenothera* blossoms. A handsome *Sphinx* larva found feeding on a species of *Arctostaphylos* most probably belonged to this species.

9. *Sphinx oreodaphne* Hy. Edw.—Considerably smaller in size than the eastern *chersis*. Larva on Oregon ash. Confined to the valley, where it is not uncommon.

10. *Sphinx sequoiae* Bdv.—An abundant insect in the valley region about Castella, and, owing to its short haustellum, feeding almost exclusively at the flowers of *Asclepias*. Larva on *Cerasus demissa*. Pupa without protruding tongue case.

11. *Smerinthus ophthalmicus* Bdv.—Not rare, and occurring up to the Canadian Zone. Larva on *Salix*.

12. *Attacus ceanothi* Behr.—Plentiful. Adults darker than coast specimens from central California. The larva commonly feeds upon *Rhamnus californica* and *Ceanothus* sp., but I have received a specimen from Carmel, Monterey County, which was feeding on *Pinus radiata*, while in Shasta County I have found a single larva on *Pseudotsuga mucronata* (Douglass spruce), etc., a number on *Salix* and *Arctostaphylos* sp.

13. *Telea polyphemus* Cram.—Fairly common in the valley.

14. *Calosaturnia mendocino* Behrens.—The larva of this species was not uncommon in July, 1903, feeding on several species of *Arctostaphylos*. Several fine adults were reared. I could find but two larvae of this fine moth in 1907.

15. *Pseudohasis shastaensis* Behr.—This is a common insect of the chaparral region, and its rapid irregular flight makes it a difficult moth to capture. Flying as it does over the brush, its wings are usually scratched and torn. The best way to procure specimens of this moth is to get up early and hunt up an unmated female, cage her and await the sunshine. The females are not easy to find and are detected ordinarily by the males which hover about her. When caged and placed in a chaparral area where the species abounds, males are not slow in

approaching the cage, always from the lea side, however, and usually flutter madly about the cage. A particularly fine and desirable variation, however, appears to be aware of his value to the entomologist and gives the place a wide berth. Over fifty perfect and a large number of imperfect males were captured by means of imprisoned females. Among them were several very black specimens and a few beautiful *denudata*. The males cease flying at about 3.30 P. M., when they alight in the brush, and a trip up the mountain slope in the late afternoon often repays one for his efforts. The females are sluggish, easily captured, but more rarely seen. In Shasta the insects hibernate as pupae, but in the vicinity of San Francisco as ova.

16. *Ctenucha multifaria* Wlk.—Fairly common.
17. *Leptarctia californica* Wlk.—Common.
18. *Diacrisia vagans* Bdv.—Common.
19. *Isia isabella* S. & A.—Rare; only two specimens taken.
20. *Platyrepia virginialis* Bdv.—A common valley species. The var. *guttata* Bdv. also plentiful.
21. *Apantesis incorrupta* Hy. Edw.—Not rare.
22. *Euchaetias oregonensis* Stretch.—Quite common in the valley. The very active larva of this species feeds on *Apocynum androsaemifolium* var. *punulum*, a small plant growing along roadsides, etc. The mature larva (July 17, 1907) is 1.05 inch long, head light brown, body pale yellow, clothed with paler, clay-yellow hairs, longest at the caudal extremity of the larva. It spins a weak cocoon composed of a little silk and its hairs. One adult reared from a 1907 larva hatched June 3, 1908.
23. *Halisidota maculata* var. *agassizii* Pack.—Not rare.
24. *Halisidota argentata* Pack.—Common. The race *sobrina* of the coast region of California is quite a pest of the Monterey pine (*P. radiata*), in Monterey County.
25. *Gnophaela vermiculata* G. & R.—Not rare in the valley.
26. *Alypia langtonii* Cooper.—Common at Echo Lake in July. Larva on *Godetia* sp.
27. *Melaporphyria oregona* Hy. Edw.—A few specimens of this alert insect taken at Echo Lake, July, 1907.
28. *Gyros muirii* Hy. Edw.—Rather rare; in the same locality as the preceding.
29. *Drasteria erectea* Cram.—A common insect in grassy localities at low elevations.
30. *Drasteria caerulea* Grt.—Common.
31. *Euclidia cuspidea* Hbn.—Common.
32. *Syneda adumbrata* Behr.—The commonest *Syneda* of the region.
33. *Syneda edwardsii* Behr.—Not rare.
34. *Syneda* sp.—A rather large species taken at Echo Lake, July 1907.

35. *Litocala sexsignata* Harvey.—Echo Lake, June, 1903.
36. *Catocala aholibah* Streck.—Not rare in the wooded canons.
37. *Catocala stretchii* Behr.—One specimen taken in August, 1907, seems referable to this species.
38. *Memythrus robiniae* Hy. Edw.—One specimen.
39. *Vespamina sequoiae* Hy. Edw.—This handsome species was found infesting *Pinus ponderosa* and *attenuata*.
40. *Sanninoidea opalascens* Hy. Edw.—One female.
41. *Albuna pyramidalis* Wlk.—One male.
42. *Sesia mellinipennis* Bdv.—In August, flying about black oak.
43. *Sesia rutilans* Hy. Edw.—Common, at flowers and about black-berry vines.
44. *Sesia novaroensis* Hy. Edw.—One female flying at the base of a young spruce tree.
45. *Sesia behrensii* Hy. Edw.—Fairly common in dry stony areas along streams, where it was taken on polygonaceous flowers.
46. *Hepialus behrensii* Stretch (?).—One pair taken in the mountains in July. They seem closer to *behrensii* than to anything else.
48. *Hepialus lenzi* Behr.—Nine specimens of this little "ghost-moth" taken at Echo Lake, July, 1907, besides several taken in the valley at an earlier date in 1903.

### Two New North American Phloeothripidae.

CORRECTIONS.—In my recent article published in ENT. NEWS, Vol. XX, No. 1, pp. 28-32, under the above title, the following printer's errors have been noticed:

Page 29, line 19: "5, 1-1x1; 6, 1-1x1" should read "5, 1-1+1; 6, 1-1+1."

" " 2 of measurements: "1.47 mm." should read ".147 mm."

" " 5 of foot-note: "5, 1-1x1" should read "5, 1-1+1."

Page 30, line 1 of key: "Head one-quarter as long as wide" should read "Head 1.4 times as long as wide."

Page 31, line 5: "backish" should read "blackish."

" " 6: "5, 11+1; 6, 11+1" should read "5, 1-1+1; 6, 1-1+1."

" " 1 of measurements: before "length .27 mm." insert "head."

It was the intention of the writer that the figures be inserted in the text, and hence they were left unnumbered. They should be numbered as follows: upper left hand corner, 4; upper middle 1; lower middle, 3; remaining figure, 2.—J. DOUGLAS HOOD.

MR. HENRY ENGEL has published A Preliminary List of the Lepidoptera of Western Pennsylvania, Collected in the Vicinity of Pittsburgh (reprinted from the Annals of the Carnegie Museum, Vol. V, No. 1, 1908). This is an important communication and will stimulate interest among the collectors of the State. There are 1439 species, and 68 varieties making a total of 1507. In conjunction with Mr. Laurent's list and the list of diurnals published by Skinner and Aaron, from the Eastern part of Pennsylvania, we have a good foundation for future work.

## A New *Catocala* from Arizona.

By C. R. BIEDERMAN.

### *C. werneri*.

♀.—Head gray; thorax dull gray, central portion longitudinally brownish. Collar anteriorly marked by an angulate white line, edged with black on either side. Patagium gray edged with black. Abdomen rather short, dull yellow, brownish toward apex which is abruptly pointed. Superiors gray, flesh tint to brownish slate color. Transverse anterior line black, shaded brown on basal side, upper part distinct, lower covered by a large saddle-shaped patch of blackish brown, which takes up one-half the wing area, commencing near the hind angle along the inner margin to within 3 mm. of base, and extending upwards until it nearly covers the subreniform, basal dash black, light gray shade upper side, basal line black, joining basal dash imperfectly. Transverse posterior line black, shaded with brown anteriorly, extends about 4 mm. when covered by blackish patch. Tooth near cell, short, two equal points, obscured by dark patch. Reniform dark brown, disk light bluish gray, irregular, three dark spots give the appearance of a human face; secondaries medium, vermilion red; median band black, irregular obtuse angulate, fusing with brown basal shade at inner margin, marginal band black, slightly irregular; five distinct spurs at anal angle, narrow, turns upward and joins median band; fringes fade to light straw color at extreme edge. Expanse 51 mm.

Distinguishing features: first the dark patch resembling a saddle the horn of which is formed by the upper part of the transverse anterior line, the end of the seat is elongated upward to the apex; second, the human face-like reniform.

*Habitat*.—Huachuca Mountains, altitude 8,000 feet. June 15, 1908.

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The *Ottawa Naturalist* has published a special Memorial Number\* as a tribute to Dr. James Fletcher, under a committee specially appointed by the Council of the Ottawa Field Naturalists' Club, consisting of Mr. Arthur Gibson (acting editor), Mr. W. H. Harrington and Mr. F. T. Shutt. These loving tributes to our dear friend tell to others what a truly great and able man he was. The appended list of his writings show an unusual industry, the more remarkable when we think of his many other activities.

ABOUT the middle of May the Hawaiian Board of Agriculture and Forestry hope to be in a position to engage an assistant entomologist. They want an economic entomologist inclined to take up Coleoptera or Parasitic Hymenoptera as a specialty and one good at laboratory and field work. Their equipment and library are good, salary \$1500.00-\$1800.00 per annum, depending upon the man. The climate of Hawaii is unexcelled and opportunities good. Correspondence might be opened now. State age, schools, experience; also give references.

Address JACOB KOTINSKY, Superintendent of Entomology, Board of Agriculture and Forestry, Honolulu, Hawaii.

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\*Vol. XXII, No. 10, Jan., 1909.

## Some Corrections in *Somatochlora* (Odonata—Dragonflies).

By E. B. WILLIAMSON.

In the ENTOMOLOGICAL NEWS, April, 1906, pp. 136-138, Plates V. and VI., I published some notes and figures of species of *Somatochlora*. Since that time M. Martin's Cordulines, Coll. Zool. du Baron Edm. de Selys Longchamps, has been published; and this and correspondence with Dr. Calvert and the examination of other material show some serious errors in my earlier paper. M. Martin's figures of *S. hudsonica* are of a species entirely unknown to me, and all that is said in my paper under this name refers to *septentrionalis*. In fact, I so named Dr. Atkinson's Newfoundland specimens, and they still bear this label, the change in my MS. being made when I discovered in the Harvey collection a male specimen of a different species labelled *septentrionalis*. It now appears that the Harvey specimen should be referred to *franklini*. This is the specimen listed under No. 72, p. 9, in Professor Harvey's Catalogue and Bibliography of the Odonata (Dragonflies) of Maine, University of Maine, Studies No. 4, published after Professor Harvey's death. Professor Harvey's first reference to the species is in the ENT. NEWS., November, 1901, p. 275. In the Harvey material in my collection is a teneral female of the same species, taken at Orono, Maine, June 2, 1899, Bartle Harvey. This specimen has the vulvar lamina and wings as described by de Selys and Hagen for *franklini*. Hence in Professor Harvey's papers and in my paper all notes and figures under *septentrionalis* refer to *franklini*. The necessity for these corrections have been known to Dr. Calvert and myself for some time, and my attention was first called to them in a letter from Dr. Calvert. M. Martin, in his paper mentioned above, on p. 25, under *S. franklini*, quoted de Selys' description, in Syn. des Cordulines, of the male appendages of *S. septentrionalis*. This description, so quoted, if my present determinations are correct, is gravely misleading. In fact neither de Selys or Hagen ever described the male of *franklini*, and there is no evidence that either knew it. Hagen, in his Syn. Od.

America, 1875, adds Saskatchewan River to its range, but the material for this record is not mentioned.

Recently at Urbana, Illinois, through the kindness of Mr. C. A. Hart, I examined the dragonflies in the Bolter collection, now the property of the University of Illinois; and we found there five males and two females of a *Somatochlora*, all labelled Duluth, Minn., which are decidedly interesting in this connection. The appendages of the male agree with those of Harvey's male of *franklini*, fig. 1. pl. V., of my earlier paper, and the individuals from the two localities are otherwise very similar. However, I believe they are distinct, and the differences are pointed out in the following description:

***Somatochlora macrotona* n. sp.**

Abdomen, including appendages, ♂ 41-42, ♀ 40-41; hind wing ♂ 27-28, ♀ 26-27.

In both *franklini* and *macrotona* the ♂ appendages suggest *forcipata* and *semicircularis*, and in the two species, *franklini* and *macrotona*, are indistinguishable so far as I can determine. As in *franklini* the basal spot on the hind wings in the ♂ is small and extends no farther than the anal loop, and may extend only slightly and indistinctly beyond the anal triangle. In *macrotona* this spot is paler, but the specimens may be faded by exposure to light. The only differences I am able to detect between the males of the two species are in the length of the abdomen (41-42 in *macrotona* as compared with 36-37 in *franklini*), and the relative robustness of the head (7 wide in *macrotona*, 6.5 in *franklini*).

The ♀ shows the same great difference in length of abdomen when compared with *franklini* (40-41 in *macrotona*, 33 in *franklini*), and leaves no doubt as to which species deSelys had before him. The head, as in the ♂, is wider than in *franklini*. Moreover, the female appendages of *macrotona* are 3 long, as compared with 2 in *franklini*. In both species the vulvar lamina is a dish-shaped ellipse, reaching the end of the ninth abdominal segment. But on the second segment of the two females of *macrotona* genital lobes fully half as large as those of the male of the same species are developed. I know of no such development in any other species of *Somatochlora*. At first glance I thought the apical abdominal appendages of a female specimen had been attached by some careless student to a male individual. It is altogether unlikely that de Selys could have overlooked such a character in the two examinations he made of the ♀ type of *franklini* in the British Museum (the specimen later incorporated in his own collection). The type ♂ and ♀ of *macrotona* are in the Bolter Collection, University of Illinois, Urbana.

Some venational characters of the ♂ and ♀ of *franklini* and the 5 ♂ and 2 ♀ of *macrotona* have been noted. The subtriangle in hind wing is present in all. In both species M<sub>4</sub> and Cux in front wing are strongly convergent, never more than 2 rows of cells between these veins beyond the first row of post trigonal cells, excepting occasionally at the extreme wing margin where there may be from 1 to 3 small cells. This character is valuable in defining groups within this genus. There is considerable variation in the distal end of the anal loop, due to the weakness of the enclosing veins, and the width at the extreme apex may vary from 2 to 4 cells. Other venational characters may be tabulated for clearness. These characters are given without any implication that specific venational differences exist between the two species. In the two the size of the wings is nearly the same, *franklini* being possibly 1 shorter. *Macrotona* has the longest abdomen, relative to alar expanse, of any species of *Somatochlora*.

CHARACTERS	<i>Macrotona.</i>		<i>Franklini.</i>	
	♂	♀	♂	♀
Triangle front wing followed by 2 rows of cells	3	4	2	2
Triangle front wing followed by 3 rows of cells	7			
Triangle hind wing followed by 2 rows of cells	8	4	2	2
Triangle hind wing followed by 3 rows of cells	2			
Triangle front wing without cross-vein (open)	4			
Triangle front wing with cross-vein.....	6	4	2	2
Triangle hind wing without cross-vein (open)	6	2		1
Triangle hind wing with cross-vein.....	4	2	2	1
Antenodals front wing.....	1 with 6. 8 " 7. 1 " 8.	3 with 6. 1 " 7.	1 with 7. 1 " 8.	1 with 6. 1 " 7.
Postnodals front wing.....	2 with 4. 4 " 5. 3 " 6. 1 " 7.	4 with 5.	1 with 7.	2 with 6.
Antenodals hind wing.....	9 with 5. 1 " 4.	4 with 4.	2 with 5.	2 with 4.
Postnodals hind wing.....	3 with 6. 6 " 7. 1 " 8.	1 with 5. 3 " 6.	2 with 8.	2 with 6.



## The Distribution of the North American Species of *Phytonomus* (Coleoptera).

By R. L. WEBSTER, Ames, Iowa.

The home of the genus *Phytonomus* seems to be in eastern Europe, or the western part of Asia, since in that portion of the world are found the largest number of species. In this genus, and in its close ally, the European genus *Hypera*, a large number of species have been described by European systematists from eastern Europe and western Siberia, so there is little doubt that the home of the genus may safely be placed in that part of the world.

There are eleven species of this genus listed as occurring in North America, and the most common of these are *Phytonomus punctatus* Fab., *P. nigrirostris* Gyll., and *P. comptus* Say. The first two species are of European origin, having been imported into this country, where they are seriously injurious to clover. The last, *P. comptus*, seems to be a native North American species. The remaining eight species are scattered; each with a comparatively narrow range of distribution. One of these, *Phytonomus rumicis* Linn., another European species, has also been found in Massachusetts, where it is attempting to gain a foothold along the coast. In the Bolter collection of Coleoptera at the University of Illinois are eight specimens of this species taken at Nantucket Island, Mass., on vetch. Bargagli reports *P. rumicis* as occurring in northern Europe feeding on *Rumex*.

*Phytonomus punctatus* is commonly known as the "clover leaf weevil," because of its injury to clover, both in the larval and adult forms. It was described by LeConte as *P. opimus*, but LeConte's specimens were clearly the European *punctatus*. In 1881 the insect was noticed in New York, where it caused considerable injury to clover. Since that time the beetle has gradually worked westward, making its first appearance in the clover fields. In June and July, 1891, it had reached Allegheny County, Pennsylvania (Hamilton), and in June, 1893, it was found at Wooster, Ohio (F. M. Webster). In 1904

the beetle was very numerous in clover fields in the vicinity of Urbana, Illinois. There is one specimen in the old Lugger collection at the University of Minnesota labeled from Wisconsin. Dr. Fletcher reported it from Ontario, in the vicinity of Lake Ontario. To the south the species extends into North Carolina.

A single isolated occurrence of this species is at Victoria, B. C., where a few specimens were collected by a correspondent of Dr. Fletcher's. According to Hamilton the beetle is found from the southeastern part of western Siberia, westward over all Europe, even into Barbary. While the occurrence in British Columbia is probably an isolated outbreak, due to an artificial importation, there remains a possibility that the insect may be found in eastern Siberia and Alaska, and in this way connect up the distribution with Asia.

*Phytonomus nigrirostris* is also a species imported from Europe, but its range in North America is not so wide as that of the preceding species. It is apparently still close along the eastern coast, from Nantucket Island, Mass. (Bolter collection) to New Brunswick (Fletcher), although Schwarz reports it from Michigan. Dr. Fletcher reported this species more abundant and more destructive to clover than *Phytonomus punctatus*.

The species *P. comptus* seems to be indigenous. I have found only records from North America, and most of these from the Mississippi valley. In the Bolter collection are specimens from Illinois, Missouri, Lake Superior and New York. Other records are: Indiana (F. M. Webster), Iowa (Wickham), Colorado Springs and Dixon Canons (Wickham), Cincinnati, Ohio, and District of Columbia. LeConte also records Canada.

LeConte and also Bargagli cite *P. elongatus* Gyll. (Payk) as occurring in Greenland. In the Bolter collection there is a single specimen under this name from Northern Illinois. It is doubtful, however, that this is the correct determination of the specimen. With LeConte's original description of *Phytonomus castor*, Canada is given as a locality for its occurrence.

No other records of the species were found. *P. eximius* Lec., like *P. comptus*, is a central North American species. It has been found at Topeka, Kansas (Popenoe), Texas and Illinois (Bolter). LeConte's *P. setigerus* was described from Kansas specimens, but I have found no other record of this species. *Phytonomus quadricollis* Lec. has rather a higher range of altitude than the other species, according to the records of its occurrence. LeConte described the species from Dakota, and the Bolter collection contains specimens from Yukon, Las Vegas, New Mexico and Wyoming. *Phytonomus pubicollis* Lec and *P. seriatus* Mann. are northwestern species. LeConte gives Vancouver Island as the source of his type specimen. The Lugger collection contains a single specimen, labeled from Alaska, which I have determined as this species. Hamilton notes *P. seriatus* as occurring at Kadjak, Alaska.

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## Descriptions of Three New Sesiidae.

By WILLIAM BEUTENMULLER.

### *Sesia rhododendri* sp. nov.

*Male*.—Head black with metallic blue black reflection, and a few white scales on each side of the face. Palpi yellow beneath, black above. Collar metallic black above, white at the sides and beneath. Antennae purple. Thorax wholly purplish or bluish metallic black. Abdomen metallic black, with a narrow yellow transverse band on the posterior edges of the second, fourth and fifth segments, and a yellow line on each side from the base to the first yellow band. Anal tuft large black, narrowly edged with yellow at the sides and yellow along the middle beneath. Thorax beneath black, with a yellow patch on each side. Abdomen beneath black, with the yellow bands on the fourth and fifth segments very broad or almost covering the segments. Legs: Anterior coxae white, slightly marked with yellow, femora purplish, tibia and tarsi yellow. Middle and posterior femora metallic purplish or bluish, yellow on the inner sides. Middle and hind tibiae metallic purple, with the spurs and tufts pale yellow. Tarsi pale yellow, scaled with black above. Wings transparent, narrowly bordered with purple along the costa inner margin and broadly margined with the same color along the outer margin. Borders with a few yellow scales. Transverse mark purple, as are also the veins. Hind wings transparent, narrowly bordered with black which appears brassy in

certain lights. Underside of fore wings with the borders golden yellow, with the veins and transverse mark like above. Expanse. 10-15 mm.

*Female*.—Very similar to the male in color and markings, but the transverse bands on the abdomen are broader and cover the segments beneath. Sometimes these bands are whitish at the middle beneath.

*Habitat*.—Cheltenham, Pa.

Described from twenty-five specimens kindly sent to me by Prof. H. A. Surface, the economic zoologist of Pennsylvania.

*Sesia rhododendri* is closely allied to *Sesia pyri* and *Sesia scitula*, but may be distinguished at once from these species by the absence of the yellow marking on the thorax. In *rhododendri*, the thorax is wholly metallic blue black above, while in *scitula* and *pyri* the thorax is distinctly marked with yellow along the patagia and at the posterior end. The larva of *rhododendri* infests the branches of *Rhododendron*. The types are with Prof. Surface and in the American Museum of Natural History.

***Sesia utahensis* sp. nov.**

*Female*.—Head, black on the vertex; front and palpi golden yellow; collar black with a bluish reflection, edged with golden yellow in front. Antennae black with a metallic bluish lustre. Thorax brown with a broad golden yellow band along the patagiae and a spot of the same color at the junction of fore wings and thorax; posterior part of thorax edged with golden yellow hairs. Thorax beneath golden yellow. Femora golden yellow above, brown beneath; tibiae golden yellow with a broad brown band at the tip; tarsi with first joint golden yellow, remaining joints brown. Abdomen with a very broad golden yellow band at the posterior part of the second segment above and below; fourth and last segments wholly golden yellow; first, third and fourth segments brown above with a few yellow scales, beneath brown, except the fifth, which is wholly golden yellow. Anal tuft golden yellow, black at the sides and in the middle. Fore wings brown with usual transparent spaces golden yellow; hind wings golden yellow basally, brown outwardly, including the fringes. Under side of wings golden yellow slightly scaled with brown outwardly. Fringes brown. Expanse, 23 mm.

*Habitat*.—St. George, Washington County, Utah. June.

Described from a single female collected by Mr. George Englehardt on an expedition to Utah for the Brooklyn Institute of Arts and Sciences.

This species may be known readily by the opaque wings, and

the very broad golden yellow bands on the abdomen. It is allied to *Sesia edwardsii*, but differs from it by being larger and having differently marked abdomen and wings.

***Sesia rubricincta* sp. nov.**

Head blue black, metallic; collar with brassy metallic lustre, edged with orange anteriorly; eyes purplish; palpi orange, last joint black above; antennae blue black. Thorax green or blue black, metallic, patagia with orange red hairs. Abdomen blackish along the back, bright red along the sides; anal tuft metallic green black, red in the middle. Thorax beneath, orange. Underside of abdomen with first and second segment, metallic blue black, remaining segment red. Legs steel blue. Fore wings steel blue black, purplish outwardly, bright red between the veins, fringes brown, slightly edged with purple. Basal transparent area narrow, outer transparent area slightly apparent, transverse mark purple with a rather large red spot; at the base of wing a bright red mark. Hind wings transparent, outer margin narrow, purple, fringes brown. Fore wings beneath similar to the above, but not so brilliant and wanting the red spot in the transverse mark at base with an orange streak at the costa. Hind wings beneath same as above. Expanse 17.50 mm.

*Habitat*.—Palmerlee, Cochise County, Ariz. August.

Type, one female, collection of Brooklyn Institute of Arts and Sciences, collected by Jacob Doll.

This species is closely related to *Sesia bolteri* Hy. Edwards, but is very distinct.

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New York.

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*The author of this partial bibliography would be obliged to others for bringing to his attention any omissions, corrections, or additions.*

WILLIAM PAUL GERHARD, C. E.,  
33 Union Square, New York.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., FEBRUARY, 1909.

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It not infrequently takes a hundred years for humanity to fully recognize the claims of an individual to its homage, and it may take many years to have scientific facts made useful. This latter is illustrated in regard to the *Bacillus tuberculosis*, the cause of consumption, which has been known for considerably over a quarter of a century.

At the present time people are buying Red Cross Stamps to aid the so-called White Plague movement and soon will be expectorating on the sidewalk for the benefit of hungry house-flies.

Meat, fruit and vegetables are exposed for sale on the street and in the appropriate season are resorted to by this disgusting manure-bred insect, the house-fly, in large numbers. Each morning the fruit is brushed with a feather duster. The object of this is to remove street dirt composed largely of dessicated horse-manure, dried sputum, fly-specks and other interesting matter. What escapes the duster goes into the stomach of the consumer.

We spend thousands of dollars to bring a tuberculosis exhibit to town containing many things supposed to cure and in many large cities there is not even an elementary attempt at prevention.

We were recently asked why it is that entomologists were looked down upon by mammalogists, ornithologists and other naturalists, and our reply was that if the latter classes were guilty of this it is due to their pitiable ignorance. To one

who began the study of Entomology when there was no public recognition or appreciation of its value as a permissible scientific study, the meetings at Baltimore with the large attendance at the sessions of the Association of Economic Entomologists and the Entomological Society of America were most gratifying. The value of Entomology in its economic bearings will be appreciated more and more, and the time is rapidly approaching when Entomology must take a very high rank as a study of the first importance and entomologists will be second to no other body of men as searchers after scientific truth.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

When you stand collecting down under the light,  
And others are standing there, too;  
Remember that everything flying around,  
Is not there on purpose for you.  
When along comes a luna with long graceful wings,  
Or a spinx of enormous size,  
If you do not *need* it give others a chance  
Let some one else take it in for his prize.  
And if something "rare" should alight on the ground,  
And all make a rush for the spot;  
With five or six nets on the poor little thing  
'Twill be spoiled, much more likely than not.  
And after success comes to you for a while,  
And you take three or four of a kind,  
Now do not be selfish but give one away,  
It will pay in the end you will find.  
In short have politeness wherever you are,  
It is not a very hard task,  
It will make your collecting more happy we know,  
Just try it—'tis all that we ask!—WILLIAM PLACE, JR.

COLLECTING AT MARTHA'S VINEYARD.—While collecting at Cottage City, (now Oak Bluffs) Mass., on the island of Martha's Vineyard, in August, 1907, the writer took in a clover field 6 ♂ and 5 ♀ *Colias eurytheme*.

The specimens appeared to be freshly hatched as there was not a blemish on some of them.

All were taken in about ten days.

It could not be questioned but that the specimens had gone through

all their transformations in that field as it would have been impossible for them to have flown north and all be so fresh and perfect.

The field was always alive with *C. philodice*, but a *eurytheme* could be easily picked out at a distance of 50 yards or more.

The only satisfactory conclusion the writer could arrive at, was that some female had flown north, probably in some southeast gale, in the latter part of the previous summer, and had oviposited in the field, the late appearance of the butterflies being due to the backward season.

Some of the other captures of note on the island were *Junonia coenia*, *Erebus odora*, and *Fentonia marthesia*.

Before closing this article, I would like to state that the past season has been very unusual in Rhode Island for the number of *Junonia coenia* which have been taken and seen; the writer has taken six specimens and has authentic records of three more besides a number of others which were seen.

I should be glad to correspond with anyone who has taken *C. eurytheme*, or any other southern butterfly in the North.—WILLIAM PLACE, JR., Providence, R. I.

A NOTE ON ANTS.—During the latter part of August of this year my attention was attracted by a line of ants (*Formica subsericea*) passing along the edge of a bank in the lawn, each one carrying a wriggling, squirming fly larva. The procession was traced and found to end at a nest in the corner of the lot into which the ants disappeared with their booty. The other end was found at a swill-bucket about thirty feet away. This bucket was literally alive with a mass of *Sarcophagus* and *Tachnia* larva. There was an almost unbroken line of ants from the nest to the bucket and return but nothing like a phalanx formation.

The raid on the larvae continued uninterruptedly for three days when the bucket was cleaned by the city workmen. During this time the ants must have carried hundreds of fly larvae in all stages of development into their nest.

Mr. Arthur C. Burrill and myself then excavated the nest over an area two feet square and to a depth of about two and one-half feet, and, although many large chambers were opened the fly larvae were not found, they evidently having been carried to a greater depth. The summer had been unusually dry and ants' nests were carried down very deep to reach moisture.

Unfortunately, pressure of other work prevented my keeping as close a watch on the nest as I desired so I can give no further history of the fate of the larvae. Undoubtedly, many were consumed as food, but a few must have burrowed into the ground surrounding the chambers of the nest and there pupated, later to issue as adult flies. In the ground about the bucket many puparii were found.

The nest was visited daily, and although there seemed to be a greater

number of flies about the nest, a week later none were seen issuing from the nest entrances.

This is the first time I have observed a definite raid of *Formica* on a mass of larvae and thought this occurrence might be of interest.—  
GEO. P. BARTH, Milwaukee, Wis.

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## Doings of Societies.

The November meeting of the Heink Entomological Club occurred on the 22d at the residence of Mr. Knetzger, St. Louis, Mo., Mr. Heink presiding. Mr. Heink reported having taken *Pyrameis cardui* on November 18th in the northern part of the city. Said specimen bore all the evidence of having just emerged from the chrysalis.

Mr. Knetzger exhibited an albino specimen of *Anosia flexippus* taken September 21st, south of the city limits. The general color of this interesting insect is grayish, with black borders dotted with white, as in the normal specimen.

Mr. Kelbly commented on the scarcity of cocoons, which in past years have usually been abundant.

Mr. Meyer exhibited a wasp nest of extraordinary size, being 19 inches long and having a diameter of 13 inches. He took this near Creve Coeur Lake, Mo.

The annual election of officers of the Heink Entomological Club, St. Louis, Mo., took place December 20th at the residence of Mr. Geo. Graf, with the following result: President, Mr. Chas. L. Heink; Vice-President, Mr. Paul Schroers; Recording Secretary, Mr. Aug. Knetzger; Assistant Secretary, Mr. Julius Meyer; Treasurer, Mr. A. C. Kelbly; Librarian, Mr. Geo. Graf.

Mr. Graf exhibited a pair of *Lycaena isola* V. *alce* taken 5 miles from St. Louis. This species has probably never before been reported from here.

Mr. Schroers exhibited specimens of *Pholus vitis*, *Pholus labruscae*, *Hemeropterus parce* and *Cocytius antaeus*, all from Florida, the latter particularly remarkable for their size.

Mr. Heink exhibited a specimen of *Phyciodes ismeria*, which he captured at Meramec Highlands, Mo., last April. This species is extremely rare here.—AUG. KNETZGER, *Secretary*.

The fourth meeting of the Entomological Society of America was held in Baltimore, December 30th and 31st, in affiliation with the American Association for the Advancement of Science and other Societies. The number in attendance was exceptionally large.

The sessions were called to order on Wednesday morning by the President, Dr. Wm. Morton Wheeler. The report of the committee on nomenclature was received. It will be printed in the "Annals" and brought up for discussion next year. Appropriate minutes were adopted in regard to the deaths of Drs. Ashmead and Fletcher, and the deaths of Messrs. C. A. Davis, A. Craw, and A. V. Taylor were also announced by the Chair. The election of the following Fellows was announced: E. P. Felt, S. W. Williston, A. D. MacGillivray, T. D. A. Cockerell, E. D. Ball and also the election of thirty-nine members.

The following suggestion was considered and referred to the Committee on Nomenclature: "That the Entomological Society of America should undertake to get out a list of all names of insects to be used as a standard code like the A. O. U. code." The following resolution was adopted and referred to the Executive Committee with power to act: "That it is the sense of the Society that the duty on insects is objectionable and should be abolished."

An amendment to the constitution was proposed, to be voted on at the next meeting, abolishing the present requirement that officers shall be chosen only from the list of Fellows. An additional by-law was adopted as follows: 6. "Any member may become a life member upon payment of \$50 at one time, and shall be exempt from further assessments. He shall receive during his life one copy of each issue of the Annals."

The following officers were elected:

*President*, Dr. Henry Skinner.

*First Vice-President*, Prof. Herbert Osborn.

*Second Vice-President*, Dr. A. D. Hopkins.

*Secretary-Treasurer*, J. Chester Bradley.

Additional members of the Executive Committee: Prof. J. H. Comstock, Dr. John B. Smith, Dr. W. M. Wheeler, Rev. Prof. C. J. S. Bethune, Mr. E. A. Schwarz, Prof. Lawrence Bruner.

Standing Committee on Nomenclature, for three years, Dr. E. P. Felt, to succeed himself.

Member of the Editorial Board, to fill the vacancy caused by the death of Dr. Fletcher, Rev. Prof. C. J. S. Bethune.

On Wednesday afternoon a joint session with Section F, A. A. A. S., was held, at which Dr. John B. Smith presided. At both this and the following session of Thursday, very full and interesting programs of papers were read.

The sessions closed with an exceedingly interesting address on Thursday evening by Dr. E. B. Poulton, Hope Professor of Zoology in Oxford University, England, on "Mimicry in the butterflies of North America." The address was illustrated by many beautiful lantern slides, and was attended by a large and appreciative audience. It, and also the full minutes of the sessions, will be published in the "Annals of the Entomological Society of America."

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The Brooklyn Entomological Society met at 55 Stuyvesant Avenue in December, 1908, with thirteen members present.

Acquisitions to the collection of photographs of eminent entomologists included those of B. Neumoegen, Herman Strecker and Harry Edwards.

Mr. Franck read a letter from a collector who is spending three years in Celebes. He mentioned the extreme scarcity of species of *Ornithoptera* and the meagre variety of *Papilio*. He had great difficulty in engaging natives to collect for him on account of their dishonesty.

Messrs. Engelhardt and Dow spoke of their collecting experiences in Claremont, N. H., last June. In the first three evenings sixteen species of Sphingidae were captured at the arc lights. During a two weeks' stay about 55 species of Geometridae were taken. There was a good variety of Heterocampids. The moths which flocked to the lights in the greatest numbers were *Actias luna*, *Anisota rubicunda*, *Hypercheiria io*, and *Biston cognataria*. *Cecropia* and *polyphemus* were common, but *promethia* does not inhabit the region. Great numbers of *Necrophorus americanus* came to the lights. At the end of June or



early July there are generally the few sultry nights of the year. At this time the Dytiscidae fly in great numbers, but at no other times during the season.

On account of the great amount of cut pine on the hillsides *Monohammus scutellatus* is about the commonest beetle.

*Basilarchia astyanax* is not common even at 480 feet elevation. On the hills 1500-1700 feet *arthemis* were in great plenty. The common *Argynnis* is *atlantis*. *Chrysophanus thoe* occurs more frequently than *hypophleas*. *Grapta progne* is as abundant as *interrogationis*. *Feneiseca tarquinius* is common as an adult.

*Cicindela* were very scarce, a few 6-guttata and one repanda being seen.

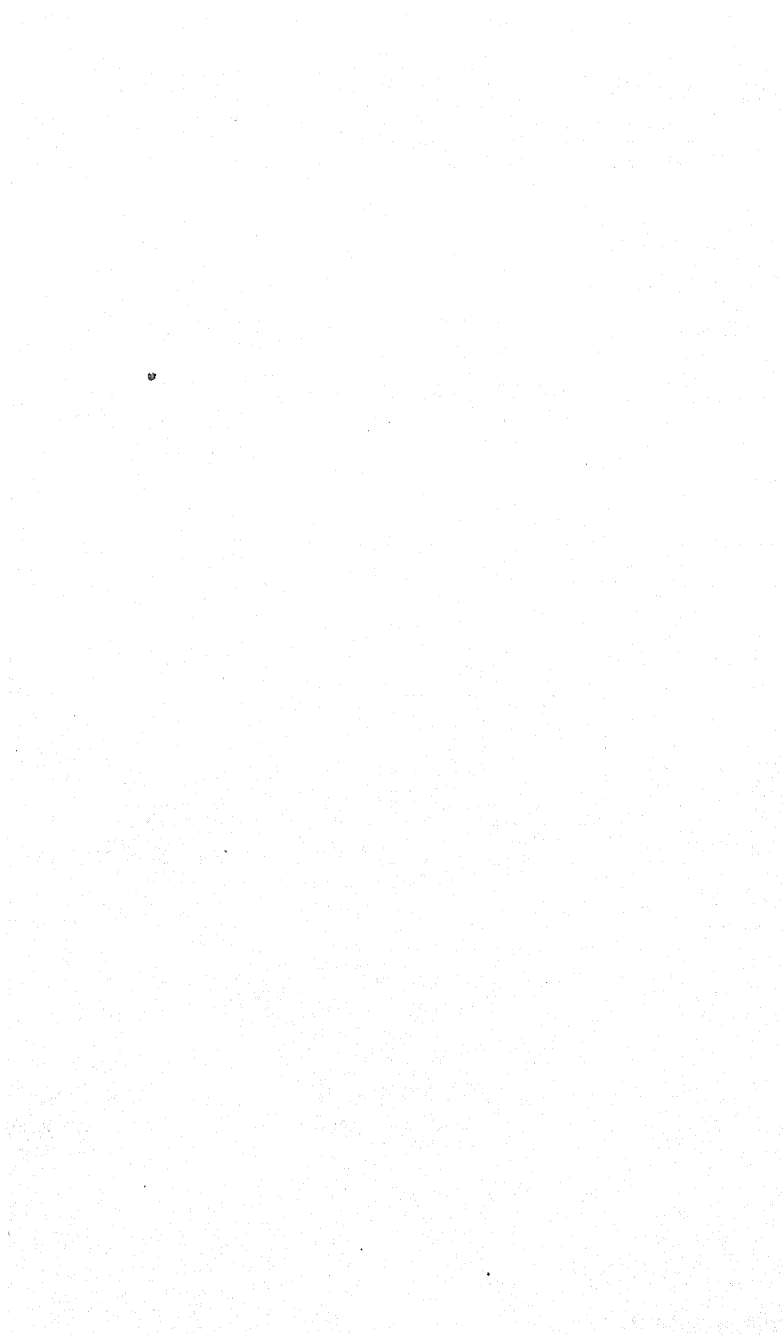
Prof. J. B. Smith exhibited a faunal map of New Jersey, which is to appear in the forthcoming edition of the "Insects of New Jersey": Its main divisions are: The coastal strip, which takes in all of Cape May peninsula, but narrows to the northward and disappears below Long Branch; the pine barrens which include the inland everywhere from a point above Lakewood south to the marshes; the Piedmont Plain, which equals the red shale belt, the highland region, from the Orange Mountains northward; and the Appalachian strip, small in extent and northeast of the Delaware Water Gap.

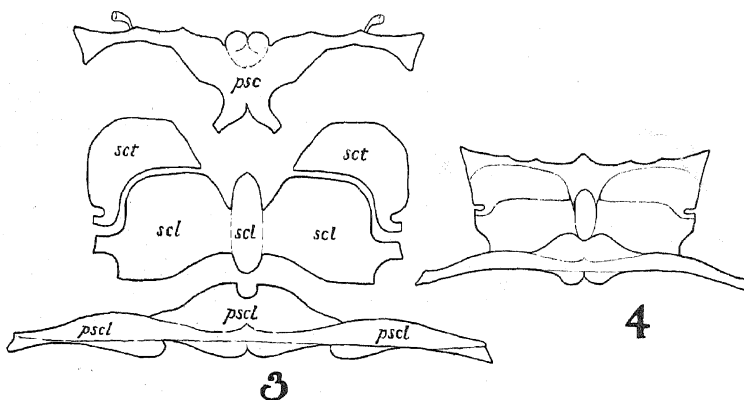
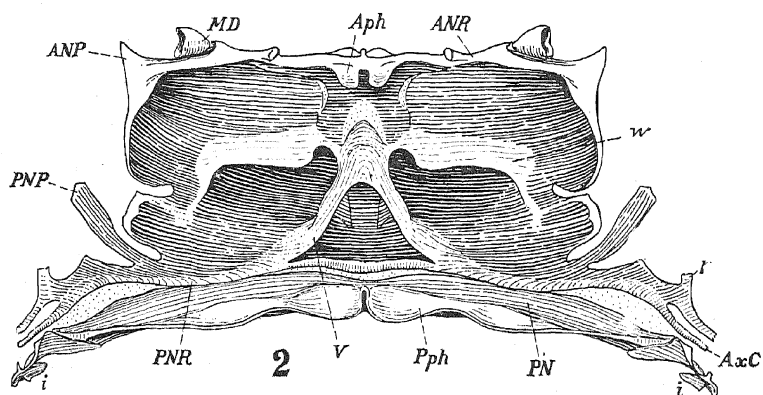
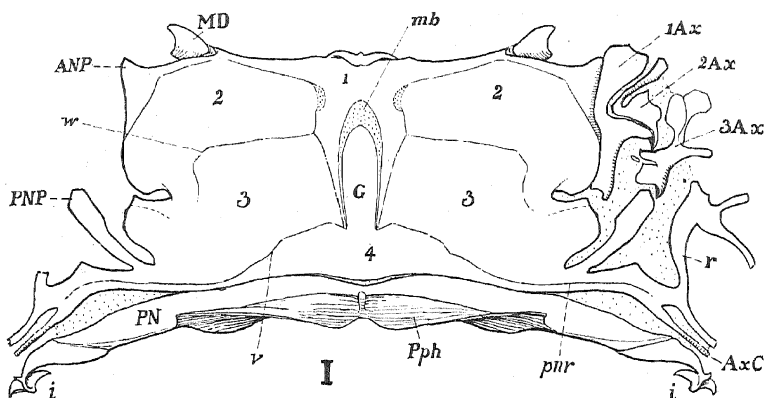
R. P. Dow, *Recording Secretary*.

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#### OBITUARY.

Mr. Samuel Auxer, of Lancaster, Pennsylvania, died on January 6th last. He was born near Elizabethtown seventy-four years ago. In early years he was a plane maker, but later became engaged in the book and stationery business. Mr. Auxer was a great lover of books, but probably loved nature better. He was an ardent collector of entomological specimens and had a large collection and exchanged with many scientists in America and Europe. He was a valued citizen of his town and had the respect of many persons, who admired him for his modesty and knowledge of nature in general. He is survived by his wife, but had no children.





THE THORACIC TERGUM OF INSECTS.—SNODGRASS.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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## The Thoracic Tergum of Insects.

By R. E. SNODGRASS.

(PL. VI.)

The idea that the hexapod thoracic tergum consists normally of four transverse plates is now unfortunately a dogma of insect morphology. Nearly all entomologists since Audouin (1824) have construed the facts in some way so as to make the thoracic terga of any particular insect conform with this supposed general quadruple structure. Though a few authors have expressed the opinion that a thorough study of the insect thorax would not bear out this conception, yet Audouin's drawings of the back of *Dytiscus circumflexus* have been copied over and over again to illustrate the general structure of the insect tergum. Two authors during the past century—Chabrier (1820) and Straus-Dürckheim (1828)—have been contented with describing the back plates just as they exist.

The object of the present writer is not to discredit Audouin, but to discredit the notion that the back of an insect segment is composed of four variously modified primitive transverse elements. This notion is fast growing into the still more erroneous one that the entire segment is a compound of four metamerous. It is true that the great advancements of any science

have been due to great conceptions of generalization, and history furnishes many examples where such ideas have arisen from inaccurate observations or have caused their author to see the facts in a distorted manner. So Audouin did a great thing for entomology when he published, in 1824, his generalizations on the insect thorax, though in establishing his theory he erroneously described the facts in some cases. It is really fortunate that no entomologist at that time made a critical examination of his data for the whole idea of reduplication of parts in the successive segments might have been then discredited. Yet it is remarkable that no one at the present time has pointed out how palpably inaccurate are Audouin's drawings of the meso and metatergum of *Dytiscus circumflexus* Fab. on which he bases his generalizations on the tergal structure.

Figure 1, Plate VI., is a drawing of the metatergum of *D. circumflexus*. On the right are shown the axillary sclerites (1 *Ax*, 2 *Ax*, 3 *Ax*) by means of which the wing is articulated to the metathorax. The dotted parts represent membrane. Now, it is perfectly clear that this tergum consists of only two actually separate plates, but these two are clearly and distinctly separated by a definite suture which is widely membranous toward the sides and narrowly so in the middle. The anterior plate bears the wings entirely, its posterior angles being produced into the *axillary cords* (*AxC*) or corrugated cord-like thickenings of the anal margins of the basal or axillary membranes of the wings. The second or posterior plate (*PN*) is comparatively narrow. It is entirely free from the wings, bears the *postphragma* (*Pph*) of the metathorax on its posterior margin, and laterally articulates with the epimera of the metathorax by special processes (*i*).

The metatergum of *Dytiscus* is, thus, composed actually of only two plates—one bearing the wings, the other free from the wings and connected with the epimera behind the wing bases. This structure is, moreover, characteristic of the metaterga of all adult Coleoptera and Euplexoptera and of both the meso and metaterga of all the other insect orders except the Aptera and the Orthoptera. The second plate is lacking in all nymphal forms and in the pupae of the lower Holometamor-

phic orders such as the Neuroptera and Coleoptera. The wing-bearing tergum of an adult Orthopteran is simply that of the nymph plus a sclerite developed behind the former. That is, the nymphal notum, from the entire lateral margins of which the wings are developed, becomes the wing-bearing plate of the adult tergum, but, in all the principal winged orders except the Orthoptera, a second tergal plate is developed in the adult behind the wing-bearing plate. This second plate is highly developed in the Lepidoptera, Hymenoptera and Diptera, especially in the mesothorax where it bears the large phragma that shuts off the cavity of the thorax from that of the abdomen. Sometimes it is reduced and hidden between, or even within, the segments. It is never present in the prothorax.

The words "tergum" and "notum" are commonly used interchangeably to denote all the dorsal sclerites of any segment. Audouin (1824) established this use of the word "tergum," while Burnmeister (1832) and Newport (1839) used "notum" in the same sense. Since, now, it is obvious that we need *one* term to signify the entire dorsal chitinization of a segment and *two others* to designate the individual plates, the writer proposes to retain the name *tergum* as the general term applying to all the chitinous parts of the dorsum of any segment, and to limit the word *notum* in its application to the anterior or wing-bearing plate. The two terms used in this manner are, hence, still interchangeable in all cases except in the wing-bearing segments of most adult insects where the tergum acquires the secondary posterior sclerite. This latter may be called, on account of its position, the *postnotum*, or from the fact that it is not a primitive tergal plate, the *pseudonotum*.

The second term has already been given to it in the Euplexoptera (Dermaptera) by Verhoeff (1903) and adopted in a former paper on the insect thorax by the author (1908), though Verhoeff may not have intended the general application of the word in this sense. The second tergal plate or pseudonotum is the one usually called "postscutellum." It is a part of the *postscutellum* of Audouin (1824), and is the *cloison costale* or *costal* of Chabrier (1820), the *postfroenum* of Kirby and Spence (1826), the *tergum* of Straus-Dürckheim (1828), the

*subpostdorsum* (including the phragma) of Amans (1885), the *metaphragma* (including the pseudonotum and true phragma) of Kolbe (1889), and the *acrotergite* of the following segment, in most cases, of Berlese (1906).

The metanotum of *Dytiscus* is a complicated plate and is subdivided by distinct lines into six regions (figs. 1, 1, 2, 2, 3, 3, 4). Two of the subsclerites (1 and 4) form the anterior and posterior regions of the notum respectively. Each is widened mesially. The former sends posteriorly two arms which interlock with an anterior median tongue of the latter forming the floor of the median notal groove (*G*). The other subsclerites (2, 2, 3, 3), as will be seen from the drawing, are paired and together occupy the greater part of the notum.

An examination of the ventral surface of the tergum (fig. 2) reveals the fact that all of the lines appearing on the surface of the notum, except those defining the anterior subsclerite are simply the external marks of internal ridges (*w* and *B*). In addition to these are the anterior and posterior marginal ridges of the notum (*ANR* and *PNR*). The ridge *w* is peculiar to the Coleoptera, the other three are common to nearly all insects.

Hence, it must certainly be evident to anyone who will verify these drawings by a study of any species of *Dytiscus* that four transverse tergal plates do not actually exist, and that only the imagination of a person intent upon establishing such a generalization could make any such construction out of the facts.

If, now, we examine Audouin's drawings (figs. 3, 4) of the metatergum of *Dytiscus circumflexus*, we are forced to admit that he made separations where he wanted them regardless of the true anatomical structure and combined other parts that are in nature distinct. Figures 3 and 4 are enlarged copies of Audouin's drawings. His first division, the *prescutum* (*psc*), is correct in a general way. The second, the *scutum* (*sct*), is likewise, disregarding details of shape. Here, it will be seen, Audouin's typical example of the scutum has this plate divided into two halves by a posterior extension of the prescutum. It is when we come to the next division, the *scutellum* (*scl*),

that the artificialness of this scheme appears. On the specimen it is clear that the median tongue on the floor of the groove (fig. 1, *G*) belongs to the part behind it and is separated from the areas at each side of it. This is further confirmed by a study of the ventral surface (fig. 2). Yet Audouin makes this the body of a bat-shaped sclerite in which the lateral areas represent the two wings. Finally, the only part that is distinct and absolutely a *separate sclerite* in nature is the plate designated *pseudonotum* (*PN*) in figures 1 and 2. Yet Audouin represents this as an integral part of the median region of the posterior notal subdivision in front of it! This combination he terms the *postscutellum* (*pscl*). A common sense separation of the plates along natural sutures could never produce such a plan of organization as figure 3.

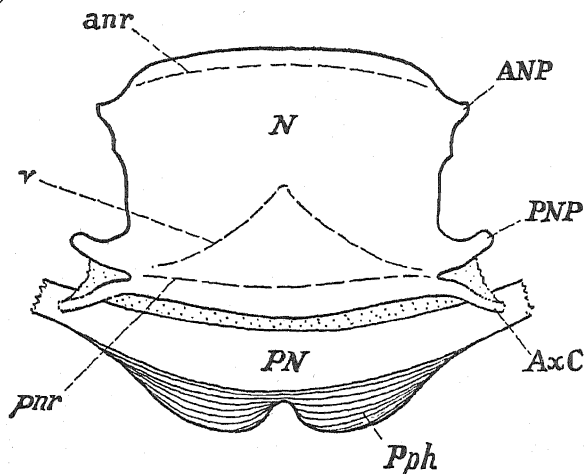
This criticism should be directed not against Audouin so much as against those present day entomologists who have contentedly copied Audouin's drawings instead of examining the subject for themselves. Furthermore a study of the works of modern insect morphologists who attempt to establish the quadruple tergal theory for all insects, as Berlese (1906), shows that this can be done only by a free use of the imagination in laying down lines where nature has neglected to do so.

Now, although we are forced to discard Audouin's historic illustration of the four divisions of the tergum, yet his terms *prescutum*, *scutum scutellum* and *postscutellum* are very convenient ones to retain, for it is true that in a very large number of insects especially in all of the higher orders, four fairly well marked tergal subdivisions are present. To what extent these subdivisions occur the writer will attempt to show in a future paper on the insect thorax. But, though they are of very general occurrence, they are purely secondary and, in most cases are not homologous in the different orders. They are best developed in the Lepidoptera, Hymenoptera and Diptera. As has already been stated the transverse ridge on the ventral surface of the Coleopteran tergum (fig. 2, *w*) does not exist in the other orders. Hence, we may regard the subsclerites 2 and 3 (fig. 1) as secondary divisions of one original area. Then we can re-apply Audouin's names as follows: region 1,



*prescutum*; 2 and 3, the separated and divided halves of the *scutum*; 4, *scutellum*; and *PN*, *postscutellum*. The postscutellum (pseudonotum) is not present in any Orthoptera. The apparent four divisions of the Acridiid pronotum are secondary and due to internal ridges, the principle of which assists the notum to perform its double role of notum and pleurum.

The following is a brief statement of the fundamental structure of the tergum of any wing-bearing segment (cf. text, fig. 1):



Observe first the two tergal plates, the notum (*N*) and the pseudonotum or postnotum (*PN*). The former is the only tergal plate of nymphal forms and of all stages in Orthoptera. It carries the wings by its anterior and posterior wing processes (*ANP* and *PNP*), while its posterior angles are produced into the axillary cords (*AxC*) which form the posterior margins of the basal membranes of the wings. On the ventral side the notum presents an anterior and a posterior marginal ridge generally folded down upon the ventral surface, the second often leaving a wide, free reduplication back of it. Between these but nearer the second is a V-shaped ridge, the entodorsum of Amans (1885), with its apex forward. These three ventral ridges commonly show on the dorsal surface as three lines (*anr*, *v* and *pnr*). This structure is fundamental, and common to

all insects, though obscured in a few cases through the greater development of secondary characters. In the higher insects the notum becomes subdivided by secondary lines or actual sutures into a prescutum, scutum and scutellum. These subdivisions are not necessarily coincident with the lines of the ventral ridges and are not homologous in all the orders where they occur.

The pseudonotum (*PN*) lies behind the notum (*N*), is free from the wings, connects with the epimera laterally, and bears the postphragma (*Pph*). When the notum presents a prescutum, scutum and scutellum, the pseudonotum may conveniently be called the "postscutellum."

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## EXPLANATION OF PLATE VI.

Fig 1.—Metatergum of *Dytiscus circumflexus*, dorsal view.

Fig. 2.—Same, ventral view.

Figs. 3, 4.—Copies of Audouin's drawings of metatergum of *Dytiscus circumflexus*.

ANP, anterior notal wing process.

ANR, anterior notal ridge.

Aph, prephragma.

1Ax, first axillary sclerite of wing base.

2Ax, second axillary.

3Ax, third axillary.

AxC, axillary cord, forming posterior margin of base of wing.

G, median notal groove.

i, points of articulation of pseudo-notum with epimera.

Mb, membranous area of notum.

MD, muscle attachment on anterior edge of notum.

PN, pseudo-notum.

PNP, posterior notal wing process.

PNR, posterior notal ridge.

Pph, postphragma.

psc, prescutum.

pscl, postscutellum.

r, united bases of anal veins fused with arm of notum.

scl, scutellum.

scf, scutum.

V, entodorsum, V-shaped ventral ridge of notum.

v, lines on surface of notum formed by ventral ridge V.

w, transverse ridge on under surface of notum, peculiar to Coleoptera, and lines on surface of notum formed by it.

## The New Jersey Records of *Hesperotettix brevipennis* (Thomas). Orthoptera.

By JAMES A. G. REHN.

In 1874, Thomas described this species from "material taken in New Jersey in August and communicated \* \* from Prof. Uhler through Prof. Glover." Three years later Uhler recorded specimens of the species as *Hesperotettix viridis*, a western form with which he had either confused it or considered it synonymous. In this paper the discoverer of the species mentioned "cranberry fields of Atlantic County" and we can assume this to be the original and consequently type locality.

Scudder in his revision of the *Melanopli* (p. 64) mentions material from "New Jersey," and until the year 1908 all our knowledge of the species from New Jersey as found in the literature is given above. In 1891 to '96, Morse had taken it at Wellesley, Massachusetts, in numbers and it was also recorded by him from Walpole, Massachusetts, while Scudder assigned material collected in Georgia by Morrison to the species. In the years 1904 and 1907, Morse recorded specimens from Sand Mountain, Georgia and Cheaha and Lookout Mountain and Turnipseed's Ranch, Alabama. In Massachusetts the insect frequented tufts of bunch-grass and was taken between July 10 and August 30, the first date, however, nymphs alone were taken. At Sand Mountain, Georgia, Morse took it from bunch-grass in open deciduous woods.

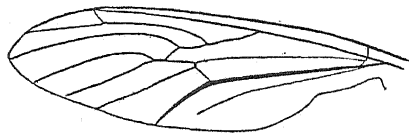
Along with other material placed in my hands for determination during 1908 by Prof. John B. Smith was a single female of this beautiful species taken at Anglesea, New Jersey, September 6. Quite recently Mr. W. T. Davis, of New Brighton, Staten Island, sent me for examination a specimen taken at Lakehurst, Ocean County, New Jersey, on August 17, 1907. While collecting at Stafford's Forge, Ocean County, New Jersey, during the past summer, the writer collected four males and five females of this species on August 12 and September 5. The individuals were found to be extremely local, occurring only in a small area of huckleberry and sweet fern barrens on the edge of pine forest and close to a large cranberry bog. The latter fact has no significance to me as the barren they preferred is extremely dry and without any bracken, sphagnum or "branch" plants, and the proximity of the bog appears to be but a coincidence. During a number of days' stay the bog and surrounding pine-land were repeatedly examined and the huckleberry and sweet fern section was the only area in which the species was found.

A single male of the species taken by Dr. Harry Fox, September 7, 1908, between Mt. Pleasant and Formosa Bogs, Cape May County, New Jersey, has also been examined. It was captured in oak and pine woods.

## Rediscovery of the Bibionid Genus *Eupeitenus*

By D. W. COQUILLET.

In 1834, Macquart describes *Penthetria atra* new species from a specimen in Servilles collection, taken at Philadelphia, and, in 1838, he erected for it a new genus, *Eupeitenus*, giving a short description and a crude figure. Walker, in 1848, referred two specimens to this species, the one from St. Martin's Falls, British America, the other from Nova Scotia, but threw no light on the characters of either genus or species, and it is not certain that his identification was correct. The species does not appear to have been recognized since, and heretofore has been referred to as a synonym of *Biblio heteroptera* Say, a member of the genus *Plecia*.



Wing of *Eupeitenus*.

Among a small collection of Diptera made by Mr. H. S. Harbeck, of Philadelphia, is a specimen agreeing in the main with Macquart's description and figure of the species mentioned above. This specimen is a female, while Macquart's was a male, and this difference, taken in connection with Macquart's well-known inaccuracy, renders the identification very probable. The specimen was captured at Germantown, a suburb of Philadelphia, on April 26, 1908. The head and its members, as also the body and legs, are essentially those of a *Plecia*; the first joint of the hind tarsi is not swollen, as the figure indicates, but this may be a secondary sexual character. The second submarginal cell is much longer than the first posterior, the first basal is decidedly longer than the second basal, and the fourth vein forks a short distance beyond the small cross-vein (see Fig. —). In all other respects this specimen agrees fairly well with Macquart's figure, and, as it came from the same locality as the type, there can be little doubt as to its identity.

The genus *Eupeitenus* is a valid one, readily distinguishable from our other Bibionid genera by the presence of two submarginal cells in each wing.

## A New Species of *Ceratophyllus*

### A GENUS OF THE SIPHONAPTERA.

BY PASSED ASSISTANT SURGEON CARROLL FOX, P. H. & M. H.  
S., San Francisco, California.

#### *Ceratophyllus multidentatus* spec. nov.

Seven specimens in all, two females and four males from *Microtus californicus*, one female from the nest of the wood rat (*Neotoma*). Mr. Rothschild kindly examined these fleas for me and *believes them to be a new species*.

FEMALE.—Head gently and evenly rounded from posterior border to the anterior ventral angle. Frontal notch very low down. Eye present, lower margin straight. Gena acutely pointed posteriorly, its lower edge curving strongly upward anteriorly. Maxilla triangular, acute at apex.



Head of male.

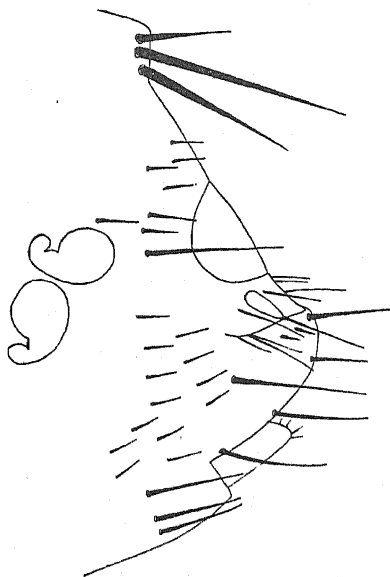


Genitalia of female.

Maxillary palpi reaching the middle of trochanters. Length of joints 12-14-11 and 15. Labial palpi including undivided basal portion, seven jointed, and reach to end of trochanters. Three rows of bristles on the genae. The lower row of three stout bristles the innermost placed above the eye, a middle row of four smaller and an upper row of six still smaller bristles. The usual number of bristles on the hind margin of the head, with two, a large and a small, at the posterior lower angle. Besides this apical row, there are on the occiput, three oblique rows of bristles, the posterior and middle row each consisting of six

bristles, of which the lowest is very much the largest, while the anterior row contains four or five smaller bristles. The antennal groove reaches within one-third of the top of the head, and is connected to the top by a chitinous thickening. The third joint of the antenna is nine jointed. On the margin of the second joint of the antenna are about five fine short hairs, while on the first joint there are about four. On the posterior margin of the antennal groove are several fine hairs.

The pronotum has two rows of bristles, an anterior row of about ten small bristles, and a posterior row of about eight larger, while on the posterior margin is a ctenidium of about 16 spines. The mesonotum has about five rows of bristles, a posterior of about ten heavy ones, the other rows being composed of more numerous, much smaller



Genitalia of female.

bristles, more or less regularly disposed. The metanotum has four rows of bristles, a posterior of about ten heavy ones, and the other rows being composed of more numerous but smaller bristles. The epimerum of the metathorax contains three rows of bristles; a posterior of three large bristles, a middle of three smaller, and an anterior of four still smaller.

On the abdominal tergites are three rows of bristles, a posterior of about 12 or 14 large ones; the bristles in the anterior and middle rows being more numerous but much smaller. On each side of the first six abdominal tergites are teeth as follows, 3-6-5-5-3-1. The abdominal

sternites have three rows of bristles; the posterior consisting of about six large bristles, and the middle and anterior consisting of smaller bristles, more or less regularly disposed. The middle row of the seventh sternite has about 12 small bristles. There are three antipygidial bristles on each side, the middle the largest and extending over the pygidium. The outer almost as long and the inner the smallest of the three. The eighth tergite dorsally contains about eight small bristles, and a long one below and anterior to the pygidium. Laterally there are two rows of bristles, the anterior composed of about six and the posterior about two, while on the apical edge there are about four large bristles. The eighth sternite is stout and has at its tip some fine short hairs. The style is cylindrical, about three times as long as wide at the base, with a long bristle at its end. The sub-stylar flap has several long hairs on its margin. There is a double spermatheca.

No teeth on inner side of hind coxae. The fore-femur has on its inner surface about eight hairs irregularly distributed, while close to its upper margin there is a row of about five very small hairs, starting at its middle and extending to its distal extremity. This row may also be found on the middle and hind femur. Along the lateral surface of the middle and hind femur there is no row of bristles as usually seen in the Syphonaptera, but there are three or four subapical bristles. Arrangement of spines on hind tibiae usual to the *Ceratophyllus*. About sixteen small bristles on the side of hind tibiae, arranged more or less regularly in two rows. A row of small bristles on the anterior surface of all tarsi. Fifth tarsal joints on all legs with five lateral spines. None of the apical bristles on the tarsi or tibia of hind leg longer than the next preceding joint. Length of joints: Hind tarsi, 27-23-15-9-13. Mid tarsi, 17-15-10-5-12. Size, 2.56 mm.

*Male*.—Head somewhat flattened on top and more abruptly rounded than in the female. Antennal groove extends nearly to top of the head. In the male specimen under examination the labial palpi seems to be but six jointed, including the basal undivided portion. First six abdominal tergites with teeth on each side, as follows: 3-6-6-6-5-4. Three antipygidial bristles, the middle the longest.

*Modified Segments*.—The manubrium of the claspers is short and thick and extends ventrad. The process is cone-shaped and contains at its apex a small bristle and just posterior to this a large one, while near the apex there are five small, but stout bristles. Just above the insertion of the claspers there is a slight protuberance which contains a long bristle. The finger is long, its upper half somewhat wedge-shaped, narrowed and rounded at the apex. Its anterior edge is straight, ending above its insertion in a deep notch. The posterior edge is longer and is gently rounded to the base where it is abruptly curved upward to the pedicle, which has the shape of a shoe. On the upper half



of the posterior edge, there are about six small bristles while on the lateral surface are numerous small hairs.

The ninth sternite is expanded at the tip, becoming somewhat fan shaped, and at the anterior and posterior angles of this expansion there are several minute hairs.

The eighth sternite is heavy, club shaped and contains numerous stout bristles at its tip and posterior upper margin.

The plate of the penis is short and very broad and bluntly rounded at the apex. Size 2.32 mm. Color pale brown.

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## The Manner of Attachment of Parasitized Aphids.

C. N. AINSLIE,

Bureau of Entomology, Washington, D. C.

During the progress of some recent inquiries by members of the Bureau of Entomology into certain habits of parasitized aphids and their guests, some exceedingly interesting facts have been ascertained and are here put on record.

It has long been known that an aphid, when parasitized, died at a certain stage of the development of the parasitic larva, and in spite of its death, managed somehow to retain its position on the host plant until after the escape of the adult parasite. It has been surmised that the death grasp of the aphid's claws might account for the ability to hold itself to a leaf while its unwelcome guest completed its life cycle. But an aphid, dead for a week, has brittle legs, and would naturally be an easy victim to wind and storm. Some have supposed that the parasitic larva was able to force a glutinous fluid through the pores of the ventral wall of the body of the aphid, fastening it in this manner.

Without definite hope of getting any light on this question, a parasitized individual of the common *Aphis brassicae* was studied. This aphid had been removed from the host plant where it was standing on the leaf, dead, and was placed on the stage of a microscope, back down. It was not yet spherical, was turning brown, and the body was still flexible. It lay on the glass slide unwatched for a few minutes, and it was then noticed that the internal larva was protruding from a rent in the ventral region of the aphid and was apparently endeavoring to escape. The larva was driven back and the aphid's

body turned to a normal position, feet down. Within a minute or two the body was found to have become firmly fastened to the slide. The slide was then turned over and returned to the stage, the body of the aphid suspended below. Through the glass the now active larva could be seen as through a window, while it completed its task of making the aphid's skin fast to the slide. A smear of glutinous fluid along the torn edges of the opening seemed to have been the first move, followed by ceaseless spinning of a silken thread from the mouth of the larva back and forth across the rent and then all over the interior of the aphid's body, thus making a delicate cocoon for itself. The drying of this silken tissue and the gradual increase of threads spun across the opening through which watch was kept, rendered the view more difficult as time went on, and finally it was impossible to distinguish clearly what was taking place within because of the opacity.

Several more parasitized aphids of the same species, taken at about the same point of development of the larvae within, were placed under constant observation, and it was learned that each was torn or split down the median ventral line, almost from coxae to cauda, by the muscular movements of the enclosed larva. This clearly did not happen by accident, for each larva went through the very same performance described above. Why the aphid's body should open along the median ventral line, the only place where it could be utilized by the helpless larva within rather than across the back where it would be disastrous, is not known at present, but the fact remains that the larva in this manner afforded an opportunity to secure itself against possible danger by fastening its frail cover strongly to the plant.

Previous to the appearance of this opening, one larva, not as far advanced, was watched through the thin walls of the aphid's body, and was seen to make a complete circuit of the interior in twenty-one minutes, driven slowly around by a series of pulsations, one hundred and eleven of which were required to bring the head again to the point from which it started. These movements probably vary with the temperature, time of year and maturity of the larvae.

The experiment of leaving the dead aphid on its back was tried, and the parasitic larva allowed to produce the usual rent in the host while in this unlooked for position. The larva did not quit its home, but made desperate efforts to reach something tangible and which it clearly expected to find. Failing in this it smeared the edges of the torn opening with a profuse supply of silk, but was helpless to adapt itself to the abnormal condition. When finally inverted it rapidly attached the host body to the glass and closed itself in as usual.

*Rhopalosiphum persicae* was observed to anchor itself, when parasitized, in precisely the same manner as *Aphis brassicae*, the body of the host being torn and immediately fastened to the glass by silken threads spun by the larvae.

Mr. E. G. Kelly, of the Bureau of Entomology, has ascertained that the individuals of the well-known, potentially pestiferous *Toxoptera graminum* when parasitized by *Lysiphlebus*, are attached in exactly the same manner by the parasitic larvae to the food plant, after the host has died a miserable and lingering death.

The above facts seem to be true only of Braconid parasites of aphids. Lack of material has prevented the acquirement of further knowledge concerning Chalcid, Cynipid or other parasites of plant lice, especially their mode of attaching the host to the plant. Larvae like those of *Aphelinus*, that do not alter the shape of the host when they produce its death, possibly trust to the death grip of the host's claws, or they may gum the ventral wall of the dead host to the leaf by a fluid forced through the body pores. At all events, an *Aphelinus*-parasitized aphid has a whole skin, apparently, and yet seems to be slightly glued to the host plant at death.

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MR. HENRY L. VIERECK has left Detroit, Mich., and is now at the Bureau of Entomology, Washington, D. C.

PREOCCUPIED GENERA IN LEPIDOPTERA.—*Pronuba* Riley, being preoccupied by *Megerle* in the mollusks, and by Thomson in the Coleoptera, I here propose for it the name *Valentinia*, in memory of our illustrious and lamented entomologist. *Dryoperia* nov. nom. for *Dryope* Chambers, preoccupied by *Dryope* Desv., and *Dryope* Bate, the former in the Diptera and the latter in the Crustacea.—KARL R. COOLIDGE.

## An Artificial Ant's Nest.

BY DR. GEORGE P. BARTH, Milwaukee, Wisconsin.

Pursuant to numerous requests to place a description of an artificial ant's nest which I have found very useful in studies of the habits of ants, the relations of inquilines and parasites to the hosts, etc., where it would be available to a larger number, the following is offered with the hope that it will prove of service to those interested.

The nest is made of two glass cylindrical jars of different diameters. The larger has a flange or a U-shaped curvature near the top. A Mason or candy-jar serves very well and is cheap. The smaller cylinder is somewhat shorter, usually about one to two inches, and is conveniently made by cutting off a bottle at the desired height. The difference in diameter of the jars may be as great or little as one desires, varying according to the size of the ant to be introduced. The smaller jar is placed within the larger and the space between the two rather firmly packed with moist earth or sand, the latter being the better as it leaves the glass clear and clean during the excavating. The escape of the ants is prevented by a cap of wire or cotton gauze loosely stretched over a rather heavy iron ring of somewhat larger diameter than the top of the larger jar. A stick or two, long enough to reach from the bottom to the top of the inner well, will provide the ants with means of access to and egress from the well.

The food cup is made by sharpening the end of a piece of tin three-quarters of an inch wide and moulding the other end into a cup. The sharp end is bent at right angles and forced into the soil between the jars. This brings the syrup and other food far enough away to avoid the soiling of the nest and thus to a certain degree preventing mildew.

The nest is easily darkened by slipping a cylinder of dark paper or cloth over the outer jar.

The advantages of this nest seem to be that:

First, it allows the ants to build vertically as well as horizontally, certainly more natural to the insect, thus giving deep and superficial chambers and galleries.

Second, the surface over which and through which the ant can burrow is very extensive and yet the nest occupies very little space and is very convenient to handle.

Third, the nest cannot be destroyed through the accidental displacement of an upper sheet of glass allowing the ants to escape, as the cover is held in place.

Fourth, it allows of a free view of the chamber and galleries from all sides. If an especially bright light is desired an electric bulb can be lowered into the well.

Fifth, the galleries and chambers have earthen roofs, floors and two sides. This is of distinct value in studying the ants' habits as they are found clinging to the roof of a chamber almost as frequently as they are on the floor.

Sixth, being of some depth the nest remains at different degrees of moisture, thus corresponding to the natural nest. The nest furthermore remains sufficiently moist over a long period of time, thus avoiding destruction through drying.

Seventh, the nest is quickly and cheaply made and is quickly and easily cleaned.

Eighth, tracings of the nest can be made by outlining the galleries and chambers on the outside with a grease pencil and taking a copy. I have found that the nest varies considerably from day to day in that some galleries and chambers are filled and others constructed.

Ninth, grass seed scattered over the surface of the ground will send down roots and provide aphid chambers and the like for such ants as build in grass plots. If a little care is exercised in not wetting the ground too much it will not "sour" or mould. I have kept such nests going for months and found the soil just as "sweet" at the end as at the beginning, the galleries and chambers of the ant and the free exposure to air by the gauze top keeping it sufficiently ventilated.

To start the nest the material gathered in the field—ground and all—is dumped into the inner chamber, the layer of earth or sand between the jars having been previously moistened. As the material introduced dries it will be found that the ants seek moisture by building in the artificial nesting site and

carry their pupa, eggs, etc., into the new chambers, the parasites and inquilines following. The well can then be emptied.

Keeping the outer cylinder of the nest dark will induce the ants to construct their chambers largely on that surface, thereby freely exposing them to view.

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## A few notes on December South Georgia Orthoptera.

BY MORGAN HEBARD.

The Christmas holidays of 1908 offered me another opportunity to study the Orthoptera of South Georgia, at Thomasville. The fall had been extremely mild and consequently Orthoptera was more abundant than usual as late as December 18. On the afternoon of that date I visited the pine woods near the town and found particularly good collecting among the dead leaves under the scrub oaks scattered through the pine forest. In these localities *Schistocerca gmnifica* was plentiful, and one or two specimens each of *Odontoxiphidium apterum*, *Belocephalus subapterus*, *Conocephalus fuscostriatus*, *Melanoplus keeleri*, *Melanoplus scudderi*, nymphs of *Atlanticus gibbosus*, *Arphia sulphurea* and *Falcicula* or *Anaxipha* were taken. In the pine woods undergrowth *Amblytropidia occidentalis*, *Aptenopedes sphenarioides* and *Orphulella pratorum* were abundant, while *Nemobius ambiguus* was frequently heard. In the nearby fields *Encoptilophus costalis*, *Orphulella pratorum* and an occasional *Schistocerca americana* and battered *Trimerotropis citrina* were discovered. A "branch" proved extremely unproductive until a small wet, grassy spot was found where two *Acrydium arenosum*, two *Nemobius carolina*, and five *Tettigidea lateralis* (four of the form *polymorpha*, as understood by Hancock), were captured. Other records made during my stay in Thomasville were two *Periplaneta truncata* found dead on the street, and one large female *Hapithus brevipennis* taken from a recess in a rail fence. Two immature *Orocharis* were also found, one under a sign on a pine tree and another living in a snug little nest indoors, made by curling up and fastening the tip of one of the fronds of a potted fern.

## Notes on *Contarinia sorghicola*.

By GLENN W. HERRICK.

(PL. VII.)

Upon assuming the duties of Entomologist at College Station, Texas, October 1st, 1908, my attention was called to the serious and widespread injury to the seed of Kaffir corn and sorghum. In many localities in Texas a large part of the crop of Kaffir corn seed was destroyed and since this plant, in the drier parts of the state, takes the place of corn quite largely the failure to produce seed becomes a serious problem to the farmers in these regions. The cause of the "blasting" of the seed has been ascribed to various agencies, fungi, insects, unfavorable meteorological conditions, etc. Thinking that the trouble might be due to the work of an insect, I carried many of the heads of sorghum and kaffir corn to the laboratory and was gratified to find many small flies and an abundance of tiny hymenopterous insects issuing. In looking up the literature on sorghum insects I found that Mr. D. W. Coquillett had described a fly, bred from sorghum heads sent him by Mr. R. H. Price from this College in 1898, as *Diplosis sorghicola*. On submitting our specimens to Dr. Howard he informed me that Mr. Coquillett determined them as *Cecidomyia sorghicola*.\*

The blasting is undoubtedly due to the work of this small Cecidomyiid, *Contarinia sorghicola*. On October 29th we bred many adults, male, and female, from sorghum and kaffir corn heads, together with an abundance of parasites, kindly identified for us by Dr. J. C. Crawford, as *Aprostocetus diplosidis* Craw. On November 29th I gathered five heads of Kaffir corn from the field and the adults of both species are still emerging, November 19. On the night of November 13th, we had quite a freeze at the College, the thermometer registering 27 deg. Of course, the heads were in the house and were not subjected to so low a temperature as 27 deg.

On November 20th, I brought several Kaffir corn heads into the laboratory to see if the freeze had been hard enough to kill the larvae and pupae. In an examination of the blasted

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\*Bull. 18 new series U. S. Bureau of Entomology, page 81.

grains, I found active larvae and, since then, hundreds of parasites and many adult *Contarinia* have emerged. The temperature was sufficient to form ice and to kill the leaves of the corn.

An affected head has a very characteristic appearance and is noted at once. The grains do not fill out and the head is much smaller and slenderer than a normal one, and becomes darker colored as though affected with a fungus disease. No doubt this appearance has led to the belief that the trouble was caused by a fungus.

The cast pupae skins may be seen in abundance clinging to the tips of the blasted grains. In an examination of many affected seeds I was able to locate the larvae and pupae. The larva lie inside the glumes and inside the delicate palet, in direct contact with the ovary at its base. It is quite evident that the larva sucks the nourishment from the ovary and prevents it from maturing. Although the ovary grows a little and increases in size somewhat, it finally turns dark in color and shrivels. In our future investigations, we hope to determine the length of the larval and pupal period and the number of generations. The pupa occupies same position as larva.

The female is a trifle over two millimeters long with a slender ovipositor (Fig. 1, o) when fully extended as long as the body. It is slender, tapering, sharp pointed, and seems to be hard and chitinous. The abdomen of the female is orange red while the head and palpi are yellow.

The antennae of the female are composed of fourteen segments, each segment, except first, second and last constricted into a short petiole at the distal extremity and clothed with long scattered hairs and with very short hairs arranged more or less in rows. The peculiar structures, known as *circumfili*, run longitudinally along the meson of each segment but branch at both ends and encircle the segment near its proximal and distal ends, (Fig. 1b). The antennae of the male are very characteristic. The segments, fourteen in number, are greatly constricted in the middle and at the distal ends. The thickened portion of each segment bears a whorl of characteristic *circumfili* (Fig. 1a). These are really long looped filaments, each loop being



continuous with the next at the base. So far as I have been able to determine there is no connection between the whorls of different enlargements. The segments also bear long hairs, usually one large hair below each loop and a smaller one alternate with the loops. In addition, rows of very fine hairs encircle the segments. The genitalia are shown in figure 1g. The wings are about twice as long as broad and clothed with fine scattered hairs. They also bear a fringe of long hairs along the hind margins (Fig. 1w).

This pest is going to be a difficult one to control and it may be that the main dependence will have to be placed upon parasites which evidently increase as the season advances and kill enough of the *Contarinia* to enable a late crop of Kaffir corn to mature its seed. If this proves true it may become necessary to plant late for a crop of seed. Of course, where the corn is desired for soiling purposes or for green feed, early planting is all right.

There is a second crop of Kaffir corn on the station grounds just maturing its seed, and the uninfested heads in this field averages in an extensive count, about ninety-one per cent. Nine per cent. of the heads were either badly or only slightly infested.

The number of adult *Contarinia* and of *Aprostocetus* bred from some of these infested heads is also interesting as throwing some light on the work of the parasite, perhaps. It would depend, altogether, whether there were one or more parasites to each host. The ratio of the emerging adults of parasite and host in these late heads is as six of the former to one of the latter.

At the time this paper was written, I was not aware that anyone had investigated the work of this pest. Later I find that Dr. C. R. Ball in 1907 came to the same conclusions regarding the sterility of sorghum and published a note on *Diplosis sorghicola* in Circular 13, Bureau Plant Industry, and again in Science Vol. XXVII., No. 681, pages 114-115, Jan., 1908.

## Two little-known Aphids on *Carex* sp.

By C. P. GILLETTE.

(Pl. VIII.)

### \* *Brachycolus ballii* Gill.

In Canadian Entomologist for 1907, p. 67, the writer gave a description of the apterous viviparous, and oviparous females and eggs of this louse and its host plant, *Carex nebraskensis*.

At that time the alate form, though much sought for, was unknown to me. While spending a day at the home of Senator J. H. Crowley, near Rock Ford, Colorado, June 1st, 1907, a single alate viviparous female was found upon a rank growth of *Carex* along an irrigating ditch. Nearly every leaf was infested by this louse in various stages of development, but not another winged louse or pupa was seen. The louse has been common upon *Carex* in the vicinity of Fort Collins all through the summer and fall where both Mr. Bragg and myself have kept a close watch for the winged form but without finding it. so I am giving the following description and Fig. 5 of Plate VII, from the single example which had the right wing injured so as to obliterate most of the venation. I mention this fact as the branching of the third sector of the wing drawn seems as though it might be abnormal.

### ALATE VIVIPAROUS FEMALE.

Head, thorax, antennae and legs black or blackish; dorsum of abdomen pale yellowish with a narrow transverse blackish dash upon the dorsum of each segment; each segment also having upon either lateral margin a dark spot, and upon segment 6 the lateral spot surrounds the cornicle; cornicles and cauda blackish, stigma of wing rather long and narrow, dusky; anterior wing hyaline with third transverse nervure thrice forked, which may be abnormal (the right wing was ruined in the single specimen studied); hind wing with one transverse vein only; cauda knobbed; anal plate bi-lobed; cornicles

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\*This species does not seem to me to fit any known genus well. It differs from Buckton's characterization of *Brachycolus* by having a longer 7th joint of the antenna and by having a knobbed, rather than a pointed cauda. The latter difference is a rather serious one allying it with the *Callipterini*.

mere pores but plainly marked; legs very short. Length of body 1.70 mm.; length of wing 2.43 mm.; length of antennae 1.06 mm.; joints of antennae about as follows: Joints I and II together .14; III, .31; IV, .17; V, .20; VI, .16; VII, .09 mm. Joint III of the antennae has 7 rather small circular sensoria in a single row (Plate I, Fig. 6). Length of hind tibiae, .54. There are neither ocular nor thoracic tubercles.

The males of this species have not been apprehended with certainty.

***Gallipterus flabellus* Sanb.**

This species was described by Prof. Sanborn from a single apterous female from a doubtful food plant and as it occurs in abundance at Fort Collins where we have taken winged and apterous viviparous females in abundance, additional notes and descriptions are here given. A quantity of alcoholic specimens sent to Prof. Sanborn were determined by him as probably the same as his type.

While the louse may attack some of the grasses, we have taken it by the thousand sweeping a small species of *Carex* that is common on low natural meadow land.

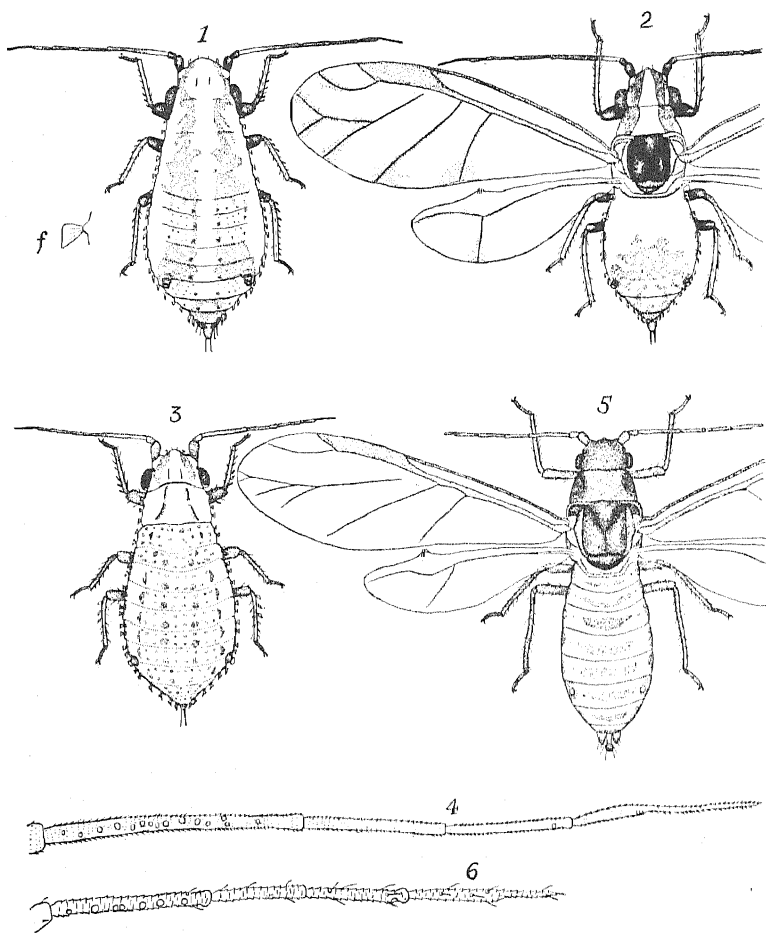
ADULT APTEROUS VIVIPAROUS FEMALE, PLATE I, FIG. 1.

The fully adult examples have been somewhat larger than Prof. Sanborn's type, and also differ somewhat from his description and figure by having the head less cone-shaped, though strongly convex, and the length (1.59 mm.) given for the antennae is probably a mistake as I have always found the antennae distinctly shorter than the body. It is probable that the figure 5 was intended for 3.

Specimens taken at Fort Collins may be described as follows:

Length, 1.70 to 2 mm.; width, .90 mm.; antenna, 1.40 mm.; 3d joint as long as 4th and 5th together; 6th a little shorter than 7th; and 7th a little shorter than 5th. The single small circular sensorium near the end of segment 5 is more distant from the end than usual, and a similar one (or two) occurs near the end of segmenet 6. All segments are free from true hairs but are thickly set with minute points giving the surface almost a velvety appearance as in the alate form (Plate I, Fig. 4); no frontal tubercles; head rather strongly pro-





GILLETTE ON CALLIPTERUS FLABELLUS.

duced on vertex; eyes dark red, prominent, without ocular tubercles; dorsum smooth or with very minute tubercles on small brown spots, but along the lateral margins are lines of small tubercles bearing flabellae; cornicles not longer than broad, somewhat dusky and upon a dusky field; cauda capitate, dusky; antenna dusky except basal half of joint three; legs short and stout, tibiae of hind legs but little longer than 3d joint of antennae; femora blackish; tibiae blackish at knees, paler below, tarsi blackish; tibiae with thickened or somewhat flabellate hairs on outer margin; beak very short, barely surpassing 1st pair of coxae; color a pale yellowish green peppered with small brown specks and having large darkened areas above. The dark areas extend along either side of the dorsum, beginning at the antennae and ending at the cornicles. They are broken into three pairs of blotches, one pair extending over head and prothorax, one pair upon mesothorax, and one pair upon abdomen before and extending to the cornicles; and there is a small one just before the cauda. Larval forms lack the large dark patches but have their backs finely peppered with dark specks and a dusky streak on either side of the median line upon head and prothorax as shown in figure 3.

#### WINGED FEMALE, PLATE I, FIG. 2.

Described from specimens taken at Fort Collins, Colo., June 8, 1908, by L. C. Bragg:

Length, 1.50 to 1.70 mm.; width, .70 mm.; antennae, 1.40 mm.; joints proportioned as in apterous form; 3d joint with about 15 very minute circular sensoria, not tuberculate; dark markings similar to apterous form except that the whole middle portion of mesothorax and metathorax above are black, and the mesothorax is black below; head broad between antennae, large; length of wing, 2.25 mm.; stigma short, broad and dark smoky in color as are the veins, each nerve ending in a dusky blotch; posterior wing with veins smoky also and with but one discoidal; otherwise like apterous form.

Comparatively few alate examples but many pupae were taken. Both apterous and alate forms are active jumpers. A few sweeps of the insect net will take this louse by the thousand now.

Sexual forms have not been studied.

#### EXPLANATION OF PLATE VIII.

*Callipterus flabellus*:—1, apterous viviparous female; f, flabellus of preceding much enlarged; 2, alate viviparous female; 3, larva of apterous viviparous female before last molt; 4, antenna of alate female; *Brachycolus ballii*: 5, alate viviparous female; 6, antenna of preceding. The lice are enlarged 20, and the antennae 80 diameters.

## The Bees of Massachusetts: *Osmia* and *Sphecodes*.

By JOHN H. LOVELL, Waldoboro, Maine.

Since Professor Packard, almost fifty years ago enumerated the described species of *Bombus* and *Psithyrus* of New England, the Anthophila of Massachusetts have received very little attention. There are, indeed, besides the two genera named very few records of the bees of this State available. Some months ago I received from Mr. Charles W. Johnson of the Boston Society of Natural History a small collection of bees belonging to the genera *Osmia* and *Sphecodes* for determination. A list of the species is as follows:

### SPHECODES.

#### *Sphecodes pithanus* n. sp.

♀.—Length 10 mm. Head and thorax black; abdominal segments 1-3 red, clouded with black, 4-5 black, 6 red. Head broad, face thickly covered with short white hair; mandibles red, simple; antennae black, the flagellum a dull red, joint 4 about as long as 3. Mesothorax faintly shining, with small not well defined punctures; wings slightly tinged with reddish, the second submarginal cell nearly quadrate, the first recurrent nervure enters the second submarginal cell a short distance in front of the second transverse cubital; stigma and nervures fuscous, tegulae testaceous; legs black, tibiae and tarsi red. Enclosure of the metathorax well defined, semi-circular, coarsely reticulated. Abdominal segments 1-2 nearly impunctate, 3-4 finely punctate at base, 5 all over; basal segment largely black, 2-3 maculated with black, 4-5 wholly black, 6 dark red.

Brookline, Mass., July 18, 1878, collected by S. Henshaw. In coloration this species most nearly resembles *S. pimplinellae* Robt.; from which, however, it is easily separated by its larger size (*S. pimplinellae* is 7 mm. long), simple mandibles, venation (*S. pimplinellae* has the second submarginal cell narrow, and the first recurrent nervure unites with the second transverse cubital), and by the color of the abdomen. The type is deposited in the Museum of the Boston Society of Natural History.

#### *Sphecodes johnsonii* n. sp.

♀.—A little over 10 mm. in length. Head and thorax black; abdomen red with black apical segments; mandibles almost entirely black, the extreme tips rufous, bidentate; antennae black, the flagellum

brownish beneath, joints 3 and 4 subequal. Face and vertex opaque, finely and densely punctured; clypeus with sparse, large coarse punctures, sides of face clothed with whitish pubescence. Mesothorax subopaque, with dense medium-sized punctures; wings strongly tinged with black, tegulae black, stigma and nervures brown-black; the second submarginal cell is strongly narrowed above so that it is almost triangular. The disc of the metathorax is coarsely reticulated but there is no distinct enclosure. Abdominal segments 1-3 are a deep red tinged with black, the basal half of segment 4 is red and the apical half black; segments 5-6 black; the basal segment is impunctate, segment 2 is impunctate in the middle, but finely and closely punctured laterally, the apical segments are finely and densely punctured, except on the apical margins.

The type, a fine specimen very carefully prepared and mounted, will be placed in the Museum of the Bost. Soc. of Nat. Hist. It was collected at Fall River, Mass., Sept. 7, 1908, by N. S. Easton. No other species of *Sphecodes* known to me has the wings so strongly suffused with black, or the abdomen so dark a red; the sculpturing of the metathorax is also characteristic. As in *S. ranunculi* Robt. the second submarginal cell is narrowed above, but in *S. johnsonii* the first and second transverse cubital nervures are separated by so small an interval on the marginal that the cell is nearly triangular. From *S. ranunculi* it may be readily distinguished by its form, color, punctuation, and in having joints 3 and 4 of the flagellum subequal, while in *ranunculi* joint 4 nearly equals 2 plus 3. This species is dedicated to Mr. Charles W. Johnson who has made many very valuable contributions to the advancement of the entomology of New England.

***Sphecodes dichrous* Sm. ♀.**

Framingham, Mass., May 28, 1904; Norwich, Vt., July 4, 1808, C. W. Johnson.

***S. dichrous* Sm. ♀, var. smaller than type.**

Monomet, Mass., July 27, 1905, C. W. Johnson.

***S. dichrous* Sm. ♂.**

Fall River, Mass., July 9, J. A. Cushman; Auburndale, Mass., July 12, C. W. Johnson.

***S. Minor* Robt. ♀.**

Brookline (Chestnut Hill), Mass., July 1, C. A. Frost.



**S. persimilis** Lov. & Ckll. ♀.

St. Johnsbury, Vt., June 27, C. W. Johnson; Essex, Mass., Aug. 1, C. E. Brown; Norwich, Vt., July 4, 1908, C. W. Johnson.

**S. persimilis** Lov. & Ckll. ♀, *var.* smaller than type.

Cohasset, Mass., June 6, 1908, Owen Bryant.

**S. obscurans** Lov. & Ckll. ♀.

Orr's Is., Me., June 24, Auburndale, Mass., Sept. 18, C. W. Johnson.

**S. prosporus** Lov. & Ckll. ♀.

Brookline, Mass., Sept. 6; Norwich, Vt., July 4, 1908, C. W. Johnson.

**S. prosporus** Lov. & Ckll. ♂.

Brookline, Mass., Sept. 6; Auburndale, Mass., Sept. 12; Norwich, Vt., July 4, 1908, C. W. Johnson.

**S. ranunculi** Robt. ♀.

Orr's Is., Me., July 25, 1907, C. W. Johnson.

**S. ranunculi** Robt. ♂.

Capens, Me., July 14, C. W. Johnson.

**S. levis** Lov. & Ckll. ♀.

Malden, Mass., Apr. 28, C. W. Johnson.

**S. mandibularis** Cr. ♀.

Auburndale, Mass., Aug. 21, C. W. Johnson; Martha's Vineyard, Mass., July 17, J. A. Cushman.

**S. nubilus** Lov. & Ckll. ♂.

Martha's Vineyard, Mass., July 17, J. A. Cushman.

**S. clematidis** Robt. ♂.

Monomet, Mass., July 27, C. W. Johnson.

**OSMIA.**

Very few species of *Osmia* have as yet been discovered in New England. "It is certain," says Professor Cockerell in a letter to the writer, "that the genus is a very large one with us, and since it seems to abound in the mountains and northward in the west I do not know why we do not see more species from the New England States."

***Osmia stasima* n. sp.**

♀.—Length 11 mm. A stout bluish-green bee, distinctly and very densely punctured; with the vertex, thorax and basal abdominal segment clothed with hoary white pubescence. Head large, with bare, subquadrate front; clypeus purple, anterior margin entire, truncate; mandibles broad, black, feebly tridentate, the margin appearing almost entire, the interval between the second and third tooth broad. Antennae black, apical joints of the flagellum brown. Wings tinted with reddish-brown, marginal cell darker, nervures dark brown, basal nerve before transverse medial, tegulae black. Legs black (hind coxae blue), with light brown hair on tibiae and reddish-brown on tarsi. The apical abdominal segment is thinly clothed with fine, whitish hair; ventral scopa dense and black.

Collected at Rockport, Mass., July 16, by C. W. Johnson. This species is allied to *O. major* Robt., but the latter has the mandibles 4-dentate. *O. major* is said to closely resemble *O. atriventris*, which has the mandibular teeth salient and well-defined; but in *O. stasima* though the mandibles are large and broad their margin is almost entire or only slightly notched. If the specimen be viewed from the front the left anterior tibia has a small but prominent tooth on the outer apex. This type is in the Museum of the Boston Society of Natural History.

***Osmia lignaria* Say, ♀.**

Fall River, Mass., May 6, J. A. Cushman; Winchendon, Mass., May 10, Dr. F. W. Russell; Squam Lake, N. H., June 22, G. Mallen.

***O. atriventris* Cr. ♀.**

N. Adams, Mass., June 14, C. W. Johnson; Cambridge, Mass., June 9, G. Mallen; Hyannis Port, Mass., July 3, C. W. Johnson; Orr's Is., Me., July 24, and Capens, Me., July 16, C. W. Johnson.

***O. inspergens* Lov. & Ckll. ♀.**

Blue Hill, Mass., June 11, 1890, J. H. Emerton.

***O. albiventris* Cr. ♀.**

North Adams, Mass., June 14, 1904, C. W. Johnson.

***O. globosa* Cr. ♀.**

Framingham, Mass., C. A. Frost.

The nest of *O. globosa* was found April 24th under a stone, and the bee came out May 2. The cell was roughly fashioned

of mud on the outside, but beautifully glazed and polished within. The opening by which the bee emerged was rather larger than its body, and the cell or chamber was probably closed by a lid as in the English *O. xanthomelana*. The species of *Osmia* vary greatly in the manner of constructing their nests; some tunnel in sandy banks, posts and decayed trees, while others use tubes and small cavities already formed. Several American species are known to construct earthen cells about half an inch in diameter.

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### A new species of *Andrena*.

By H. L. VIERECK, Washington, D. C.

#### *Andrena carolina* n. sp.

♀.—Length about 10 mm.; occipito-clypeal distance\* greater than the ocular distance,† facial fovea extending below the antennal line,‡ the former with its greatest width greater than two-thirds of the shortest distance between the lateral ocellus and nearest eye, third joint of antennae longer than fourth, plus fifth, but shorter than fourth, plus fifth, plus sixth, clypeus punctured, polished, with a median longitudinal impunctate area, process of labrum broadly rounded; abdomen with the second dorsal segment depressed less than one-half the distance between base and apex of the same segment, abdomen fasciate. Tegment almost throughout black or very dark brown in color, most of the hairs pale ochreous, the great majority of the hairs of the tibial scopa not branched but simple.

Type locality, North Carolina, U. S. A.

Type in the collection of the Amer. Ent. Soc., Phila., Pa.

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NOTES ON TWO ARGIOPID GENERA.—Crosby (Proc. Phila. Acad. Sci. LVII, 1905) proposed for the Genus *Dicyphus* Menge, preoccupied in the Hemiptera, the name *Hypomma*, but as Mr. F. P. Smith (Journ. Quekett Micros. Club, London, IV, 1904) has for the same reason given it the name *Enidia*, Crosby's genus must fall. Even were this not so, *Hypomma* would have been invalid, as Dahl in 1886 used that name for a Theridid genus. *Smitheria* nov. nom., type (*Neriene*) (*Falcoeria*) *cornuta* Blackwall, for *Falconeria* Smith, preoccupied by Theobald in the reptiles.—KARL R. COOLIDGE.

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\* The distance between the highest point on the vertex and the middle of apex of the clypeus.

† The distance between the outermost point on each eye.

‡ An imaginary straight line drawn tangent to the lowest point in the lowest point in the edge of each antennal fossa.

## Another Season with *Catocalae*.

By R. R. ROWLEY.

During January and February I received small lots of eggs of *Catocala nupta*, *electa*, *elocata* and *fraxini* from J. McDunnough, of Berlin, Germany, and C. Leonhard, of Kearney, New Jersey.

Not aware that the weather of early March was warm enough to affect these eggs, I lost much of this European stuff before the middle of the month, the larvae dying before I knew of their hatching. The few remaining eggs of *electa*, *nupta* and *elocata*, which I supposed infertile, hatched about the last of the month before there were any leaves on which to feed them. Furnishing the young crawlers (more properly "gallopers," for young *Catocala* larvae are the most energetic insects I ever had anything to do with), split buds until I could get leaves from slips of willow and poplar placed in tumblers of water in a warm room of the house.

The *fraxini* eggs hatched later and did well from the beginning, though their development was slow. The growth of the larva of this latter species must be as strong in captivity as in its wild state since the caterpillar is the largest of the "Cato' worms" and the imago much larger than any of our American species of the genus. The handsomest larva of these species is that of *electa*, a real beauty.

A quill of eggs labeled *sponsa* gave larvae that refused oak and took to poplar after most of them had died. A single imago told the story. It was *nupta*.

The growth of these European caterpillars was really exasperatingly slow, but most interesting in a developmental way. All of them fed on the food plants of *cara*, *amatrix* and *parta*, and the larvae all bear no little resemblance to the American species, all having a cross elliptical elevation or dorsal hump over the fifth abdominal segment and the latero-ventral row of short setae.

After the first moult, the larvae of *C. fraxini* are very light in color and so continue to the end of the larval stage.

I am almost tempted to minutely describe these larvae from

the full notes taken during their development, but this has been done, doubtless, by a number of European writers.

The larvae of *C. elocata* and *nupta* hide themselves when not eating (in daylight) under leaves and paper in the bottom of the jar, while those of *C. electa* and *fraxini* remain on the plant stems, rarely, even when making ready to moult, go to the bottom.

While busy with the above-mentioned species, the few eggs of *Catocala ilia*, which Mr. E. A. Dodge had given me, hatched on the 8th and 9th of April. Before the first moult, which occurred on the 18th, the larvae are light colored, striped longitudinally, with fine lighter and darker lines. Four low lateral darker-brown, roundish spots to third abdominal segment and a smaller one in front of the last abdominal segment. The head hardly darker than the body.

Before the second moult, which occurred on the 21st, the larva is somewhat darker, especially along the dorsum near the posterior end. The lower row of lateral large spots are strongly pronounced and black. Dorso-laterally, there is a row of black dots (to each side). These rows, less strong, are present before the first moult.

Head black. Before the third moult, the larva is nearly three-quarters of an inch long, gray, with a line of elongate, somewhat-lunulate dark dashes, mid-laterally, and two pairs of sub-dorsal dark, elongate spots on the two segments just in front of the first pair of prolegs. Head grey.

The larva moulted the third time on the 25th. Body light ashen gray, the black longitudinal lunulate lines almost disappearing. The pro as well as true legs light gray, with black dots (two to true leg and one to the pro-leg). The longitudinal, lateral lunulate lines dim and but little darker than the body color. The body of this larva from the hatching is rough or sand-papery looking. After the third moult the body is more visibly covered with low, raspy tubercles and short bristles. In front of the fourth pro-leg on either side of the dorsum is a small quadrangular black spot. Head light gray, with a brownish lateral dash. A latero-ventral line of fringe or setae.

Just after the fourth moult, the larva is over an inch long,

light gray, with darker markings. The dorsal light gray band of alternately expanded and contracted portions with irregularly shaded black spots above the lateral band of light gray. Above the pro-legs and true legs is a line of narrow black lunules. On top of the first abdominal segment is a large triangular (angle pointed toward the head) white spot. A lateral row of setae just above the true and prolegs. Head gray, with a lateral black dash passing entirely around. A black dot on each side of the head inside the black dashes. The true and pro-legs are gray, with white dots.

After the fifth moult the larva of *ilia* has a general ground color of light gray, with darker irregular longitudinal markings. The tubercles slightly yellow at the tip. Prolegs and feet light gray and dotted with black. Head gray, mottled with brown. A slight lateral darker dash. Larva decidedly flat. Underside, a beautiful pink, with the characteristic black spots. The lateral setae are short. The mid-lateral, longitudinal band, irregular and the lightest shade on the body. The dorso-lateral tubercles on the first abdominal segment as well as the fifth are stronger than the others. I failed to secure a pupa from the *ilia* larvae, the last two dying when fully mature. Mr. E. A. Dodge informs me that the food plant of *ilia* is burr-oak. I tried to feed them through on chinquapin oak.

On the 25th of April, in company with Mr. E. A. Dodge, I collected 50 larvae of *Catocala illecta* on honey locust sprouts. These varied in size from half an inch in length to quite two inches. Mr. Dodge found quite as many, and together we got six or seven small larvae of *C. innubens* from the same plants.

The larva of *illecta* is unlike that of any other *Catocala* larva with which I am acquainted. Its colors make it very conspicuous and it must suffer much from parasitic enemies. The full-grown larva has a longitudinal white band below the spiracles. A dark brown, almost black body color crossed by narrow, irregular white lines and with a spiracular row of red-brown spots (one to the segment) and another lateral (sub-dorsal) row of somewhat more pronounced red-brown spots, two to the segment. The red spots on the thoracic segments often coalesce forming cross bands of red. Head dove color, with three lat-

eral longitudinal black dashes and a central short one and two small lateral black spots on the top of the head. The true legs dark brown, so also the pro-legs. The under side of the body cross lined with black, and white as above, but paler.

The ventral roundish or quadrangular central row of spots black, but not intensely so. Little change in the larva from hatching to maturity in color and markings. The cross lines of white, the red-brown spots and the broad white under-spiracular band are the characteristic markings.

On April 27th I got 14 larva of *illecta* on low honey locust sprouts in a cow pasture across the street from where I live. These were all small and apparently moulting the third time. They lie close to the twig, usually a dead one, if such is on the bush, or on a bare twig, sometimes two or three quite close together. Very small larvae, probably just after the second moult, often lie along the side of a thorn and are difficult to see. A shriveled dead branchlet is a favorite place for these young larvae. I have noticed the same preference for a dead twig in the young larvae of both *C. piatrix* and *C. cara*.

On April 28th I found 30 more larvae of *C. illecta* and 101 on May 2d. Also one *innubens* larva on the latter date. May 9th, 25 larva of *C. illecta*.

A full-grown larva of *illecta* is two and a half inches long. The longitudinal subspiracular band is pearly white. The cross lines of black and white are seven or eight each to the segment. The row of brick-red spots along the spiracles shows strongly against the pearly white band below. Another more prominent subdorsal row of red spots. The end segment of the true legs is black. The pro-legs are striped crosswise. The ventral black spots are large and the ones between the pro-legs the largest.

The first *illecta* larva began to spin its cocoon on the 5th of May and pupated on the 8th. The first larva of *innubens* pupated May the 20th.

The chrysalis of *illecta* is from one and one-half to one and three-quarters inches long, deep red-brown and covered with a whitish prunescence that makes the pupa look black beneath the bloom. The larva spins a thin cocoon inside leaves and twigs, more often several inches above the bottom of the breeding jar than in the paper on the bottom.

Most of the larvae were collected after several hard frosts had killed the leaves of the plants most exposed, and when taken from the dead-looking sprouts were quite benumbed with cold. The number of parasitized larvae were few and the caterpillars thrived well in 6-gallon tin cans. A number of the larvae, after spinning, were unable to shed their skins and perished. The percentage of chrysalids that failed to yield moths was small. All in all, it is a very satisfactory larvae to handle, barring the odor from the ordure and the dropping leaves. In fact, the character of the plant and the great number of the larvae made it nearly impossible to keep the breeding cans clean and odorless, and the loss in larvae was mainly due to that cause. The first imago of *illecta* came from pupa May 30th, making the length of pupal stage 22 days.

From the two hundred and twenty larvae collected, one hundred and fifty pupae were secured, and from these latter, over a hundred perfect imagoes. The last imago appeared June 21st. From the unusual abundance of the larvae, one would think the imagoes could be readily found, but not a moth did I see in the woods or brush in the daytime. The only *illectas* I ever took were at bait at night. The apparent kinship of *illecta* and *abbreviatella*, at least in color, suggests the probable likeness of the larvae of the two species and the probable kinship of their food plants. Neither in the larvae nor in the imagoes is there any color variation worth mentioning in *illecta*.

Freshly hatched larvae of *Catocala vidua* are of an almost transparent greenish brown, becoming a dark amber, with very dark heads. Eggs of this species hatched May 10th. Toward the second moult the larva becomes lighter and more or less streaked longitudinally. After the second moult much lighter and still streaked lengthwise. The subdorsal streaks blacker on the top of the second and third abdominal segments. Body quite bristly. The top of the fifth abdominal segment a little darker than the rest, but with little appearance of being humped. True and prolegs light gray. After third moult, larva one and one-quarter inches long, quite light. Lateral row of setae. Head gray-brown with longitudinal fine darker lines and a short, dark side-dash. As after second moult the sub-dorsal



lines on the second and third abdominal segments are distinctly black and like long, slender triangles. The hump over the 3d pair of prolegs more pronounced and darker than the rest.

The fourth moult occurred May 30th, and the larva was quite two inches long, slender, lead-gray, with markings as after third moult.

The head of the mature larva is gray, streaked with lighter color and a short unnoticeable black dash either side of the mouth. Body light gray with a faint reddish brown tint. Lower lateral row of bristles or setae. Tubercles reddish. A cross triangular saddle-like spot over the 5th abdominal segment. Under side of body leaden with round black spots shaded behind by deep red. No hump.

This larva seems very difficult to rear in confinement, as all of my specimens died before time to pupate, the last one on June 13th. In the past six or seven years, this moth has not been abundant here, despite the fact a single female in captivity laid for Mr. Dodge 871 eggs. Atmospheric or weather conditions, breeding disease, are responsible for the fatality among *Catocala* larvae and not their parasitic foes. These larvae were fed on shag bark hickory which Mr. Dodge assures me is their food plant. However, after searching for three years, I have yet the first larva to find in the woods, though I have taken caterpillars of *C. epione*, *residua*, *habilis*, *obscura*, *angusi* and *robinsoni* on hickory. As large a "worm" as it is, when full grown, it is difficult to see how it can escape the collector.

Another species about as common as *vidua* and often taken with it on white oak is *C. robinsoni*, a single female of which laid 902 eggs, Mr. Dodge informs me. The same gentleman secured from a female of *C. amatrix*, a rare moth here, 436 eggs.

While the past season was certainly unfavorable for *Catocala* larval growth in most species, it was singularly favorable for the growth of *C. illecta* larvae, despite the killing frosts of April.

During this season, as through last summer, on the same walnut bush and the same willow I took larvae of *piatrix* and *cara* from the 29th of May to the 10th of August, but did not

succeed in getting a single *piatrix* larva through to maturity and but two or three of the *cara*, despite the attention I gave the caterpillars.

On the 27th of May a few eggs of *C. piatrix* that I had kept to note the early stages of the larva hatched, and at one day old the caterpillar was very small, slender, with a yellow colored head and with the front half of the body green and the last half yellow-green. Like all other *Catocala* larvae, young *piatrix* is very active and hard to keep from escaping.

On the 30th of May the larvae moulted the first time. Color light, yellowish green longitudinal lines faintly visible.

After the first moult the larva assumes its characteristic markings, and while the mature larvae differ much in the depth of color, they vary none in shape. I had at one time supposed that a larva almost white at maturity, with the longitudinal lines almost obsolete, head red and without the lateral black dash would prove to be some rare species. Unfortunately the larva died when just ready to spin. Other like caterpillars failed to mature, but thanks to Mr. E. A. Dodge, he got a moth from a pupa of this form and it was a plain *piatrix*. Another variety of larva has a rather narrow dorsal-central longitudinal band of pale red or flesh color, contracted and expanded into elongate links. A dark, mid-dorsal line traverses this band. Bordering this dorsal band on either side is a dark brown contracted and expanded band of about the same width as the dorsal band. Below this dorsal lateral band is a much broader flesh colored longitudinal band, and below this a darker band with a longitudinal black line. The prolegs are dark brown on the outside, while the true legs are light flesh color. The whole under surface is pale red or flesh color, with round, black spots. The head is black, except the sides which are pale flesh color. The white larva referred to above had a bright red head without markings.

Another form has the longitudinal lines intensified and differs much from the dark form with the bands and lines practically obsolete.

On the 30th of May I found at the base of a shell-bark hickory tree, under a bit of bark, a large larva of *Catocala residua*,

and a few days later (June 4th) I obtained 17 *Catocala* larvae under the bark of one hickory tree, while Mr. E. A. Dodge and son Ralph got nearly 30. This was a good haul for one tree.

Again, on June 9th, I took 18 larvae on shag bark hickory and on the 12th, 25. These various larvae gave us five species of moths: *obscura*, *robinsoni*, *angusi*, *judith* and *habilis*. The *judiths* were among Mr. Dodge's find. A full-grown larva of *obscura* is light gray, with somewhat lighter tubercles. The longitudinal bands hardly distinguishable. No lateral setae. On the top of the first and second abdominal segments is a black cross line extending downward only over the dorsal and sub-dorsal longitudinal bands. Head light gray, with a short lateral (mouth) dash extending hardly to the middle of the side of the head. Ventral side light gray and with the characteristic round spots, not black as usual, but brown. A broken almost white band extends backward laterally from the first abdominal segment. Feet and prolegs gray. The white lateral band is narrow and just above the spiracles. Larva two and a half inches long. A dark brown, more or less intermittent wavy line separates the lateral band above the spiracles from the broad illly-defined dorsal band. The latter includes the dorso-central and the bounding lateral bands. There is a bristle to each tubercle. No distinct hump. This larva, taken on June 9th, gave an imago of *C. obscura* on July 9th.

A full grown larva of *Catocala habilis* is two and one-quarter inches long, watery or smooth looking, gray, with a reddish tint, more distinctly red along the spiracular band. The mid-dorsal band narrow, lighter than the general color. A narrow black band just above the flesh colored spiracular band. Head grayish, with a red tint and with a broad, black lateral band. A central black spot at the top or back of the head. True and prolegs whitish, with a reddish tint. Ventral side greenish white. The ventral spots smaller than usual in this genus, pale brown. No dorsal hump and no lateral fringe or setae. Sparse, short bristles on indistinct tubercles. This larva is very active, jumping surprisingly.

The last larvae we got on hickory were taken July 4th, though caterpillars of both *habilis* and certainly *robinsoni* could have been found much later.

The larva of *Catocala angusi* is so much like that of *C. habilis* as to be easily mistaken for it. Hardly so red, not so slick looking and with a less distinct or broken stigmatal band. From chrysalids of this species I obtained one normal *angusi* and two small lucettas in early August.

On the 3d of August, Mr. Dodge took a fine *viduata* and a splendid *paulina*, while I took a gigantic *subnata*, species all rare here. On August 4th, Ralph Dodge took a fine *viduata*. On the same day I took my first and only *nebulosa* of the season. On most of our trips Mr. Frank Caldwell accompanied us.

The summer ranked fairly with the past six or seven seasons with no more *Catocalae* than usual, but we closed the year by securing great numbers of eggs of this beautiful genus of moths.

In trapping for larvae of *Catocalae* I used the same devices as last year, and added to them shingles which I leaned against the trees. I found that if two shingles slightly separated were leaned together against a bush or shrub the chances of securing a larva between the boards was greater than if a lone shingle was used. Dead twigs are favorite resting places for young larvae.

On mornings after nights of rain I was sure to find larvae, driven down by the water, no doubt.

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#### CORRECTIONS.

In my article, "Notes on the Study of Some Iowa *Catocalae*" in the January ENTOMOLOGICAL NEWS, occur a few mistakes which I wish to correct.

The fourth word on the twentieth line of the thirteenth page should be *chrysalids* not *chrysalis*.

The first word on the twenty-fifth line of the same page should be *found* not *formed*.

On the fifteenth page, thirty-second line, the fourth and fifth words should read *females* instead of two males. This is rather a ludicrous mistake.

The above mistakes might be passed without notice since the reader would readily recognize them as typographical errors, but the next two corrections are of more serious mistakes.

On the seventeenth page the thirty-fourth line should read "The egg of *amatrix* small, depressed, almost" instead of "The egg of *cara* is small dark brown, with almost white."

For the top line on the eighteenth page substitute "The egg of *Catacola cara*, dark brown with almost white."

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., MARCH, 1909.

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A meeting to form a society for the purpose of ascertaining the locality, habits, etc., of insects taken within the United States was held on February 22d, 1859, at the residence of Mr. E. T. Cresson in the City of Philadelphia. This was the beginning of the Entomological Society of Philadelphia which subsequently became the American Entomological Society. The fiftieth anniversary of the formation of this society was recently celebrated. The present set of younger entomologists can hardly appreciate the struggles, trials and tribulations of those that worked fifty years ago. There were very few persons engaged in the study and books on the subject were not many and those that were published were expensive. Money aid was almost unknown and everything was a labor of love. The proceedings of this early society were gotten out by the members, who set the type and did the press work, and all the time given to such work was stolen from their occupations for a livelihood. Some of the younger set are at times a bit critical when they refer to some of the work of the older writers and workers, but this is largely due to the fact that they do not appreciate the difficulties under which their predecessors labored or else the ability to correct a well known author tickles their vanity. Is it possible that the pioneers realized what entomology would grow to, or what it will be in the future? Probably not. They simply studied insects because they had inquiring minds and loved nature.

## Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS  
OF THE GLOBE.

THE BOSTON SOCIETY OF NATURAL HISTORY for a number of years has made the New England fauna and flora the leading feature of its museum. The main hall, including the gallery around it, is devoted to the exhibition of New England animals. The mammals and birds are displayed on the main floor. The lower vertebrates and all the invertebrates have been placed in the gallery.

*Insects.*—Owing to their scientific interest and economic importance, the insects are receiving special attention. On account of the vast number of species and the diminutive size of many of them, only a small proportion has been placed on exhibition. These are in the main gallery, contained in some eighty glass-covered boxes. About 3,000 species are shown, which are representative of all the orders of insects, and illustrate also galls, various kinds of injurious work, life histories, and sundry economic features.

It is estimated that over 11,000 insects have been recorded from New England, and of this number there are more than 5,500 species in the Society's collection. The Curator in charge is our esteemed authority on Diptera, Mr. Charles W. Johnson.

MELITAEAE GILLETTEI BARNES.—During the summer of 1906, while collecting in the Coeur d'Alene Mountains of Montana, I was fortunate in obtaining a small series of this rare species, hitherto known only from the type locality, Yellowstone Park, and Idaho. At the time of capturing the specimens I noticed that they were of a species new to me, but being far out in the wilds, I was unprepared to do better than paper my captures. One ♀ which I confined, considerably deposited a batch of eggs in the topsy-turvy way *Melitae*s sometimes have. I could discern no differences between the eggs of *gillettei* and those of *chalcidon* Boisdu., both of which I had at the same time. Larvae and chrysalids were also observed on the snow-berry, *Symphoricarpos racemosus* Michx., a common plant in that region. Five examples of *gillettei* now before me are quite constant, no perceptible variation being displayed, and answer perfectly to the original description of Dr. Barnes. Other specimens are in the collection of Mr. Fordyce Grinnell, Jr., of Pasadena. It is somewhat of a mystery to me how such a distinct and noticeable species as the present one escaped detection for so long, as it is apparently well distributed. Even while on the wing it presents a striking appearance and is not likely to be confused with any of its congeneric forms. Elrod, in his Butterflies of Montana (Bull. Uni. Montana), does not record it, although my specimens were taken only about fifty miles from where his paper was written.—KARL R. COOLIDGE.

THE REV. G. H. Raynor, M. A. in the Entomologists Record and Journal of Variation, Volume xxi, p. 4, 1909, gives the descriptions of twenty-one varieties of the butterfly *Aglaia urticae*, and then in addition describes and gives names to thirty more. Of the twenty-one previously known he reduces one to the synonymy, so that we now have fifty named varieties of this single species of butterfly. Mr. Raynor seems to be a specialist on this one species. If he turns his attention to the other butterflies and moths he will put to shame even the editor of the Record as a name mill.

JUNONIA COENIA HUBN. IN MAINE.—In Ent. News, xix, p. 386, Mr. Wood records the occurrence of this species at York, Me. I would say that during the past eight or nine years I have found stray specimens every season at Fortune's Rocks, near Biddeford Pool, a few miles further north than York. In 1908 I saw only two specimens—a slightly broken one on July 30th and a perfect one August 2nd, both of which were captured. Mr. Lyman has taken the species at Portland some years ago.

At Fortune's Rocks I also took last July two specimens of *Eurema euterpe*, Men. (*lisa*, Bd.), the first time I have observed it there. A number of other specimens of it were seen early in the month before my arrival.—ALBERT F. WINN, Westmount, Que.

NOTES ON NEW JERSEY ORTHOPTERA.—In the Journal of the N. Y. Entomological Society for December, 1908, an *Orchelimum* collected at Tuckerton, N. J., and on Staten Island, N. Y., was described under the name of *O. crusculum*. Mr. Rehn has lately compared some of the Tuckerton specimens with the *Orchelimum fidicinium* from Florida, described by himself and Mr. Hebard in 1907, and finds them to be the same, the characters mentioned for *crusculum*, such as femoral spines, differences in color, etc., not being considered of specific rank.

Another insect recently found by me in New Jersey is the cricket *Miogryllus saussurei*, which occurs in the South, and has also been found in Southern Indiana by Mr. Blatchley. At Lakehurst, N. J., it is found under dead leaves and other objects lying on the ground. My attention was first called to the insect by hearing the males stridulating at night. Their song is a slow *zee*, repeated at intervals of several seconds. Later the females were also found. At Lakehurst and on Staten Island, where I have also collected, several individuals were taken on sandy ground, it reaches maturity in June.

Individuals of this species of cricket differ markedly in the development of the hearing organ on the inner side of the fore tibiae. In two of the examples collected this organ is totally absent, in four it is slightly developed, and in one it is slightly developed on the inner surface of the right tibia, but absent on the same surface of the left leg.

The finding of these insects is only another proof of what is fast becoming an entomological axiom, namely, any species to be found in the eastern United States is likely to inhabit New Jersey.—WM. T. DAVIS.

## ENTOMOLOGICAL LITERATURE RECEIVED

Specific Characters in the Bee Genus *Colletes*. By Myron Harmon Swenk. 60 pages and 3 plates.

*Sphegoidea* of Nebraska. By Harry Scott Smith. 88 pages and one plate.

Both of these papers are contributions from the Department of Entomology of the University of Nebraska.

Bibliography of Canadian Entomology for the year 1907. By Rev. C. J. S. Bethune, D. C. L. Trans. Royal Soc. Canada. Third Series, 1908-1909.

Insect and Fungus Pests of the Orchard and Farm. By Arthur M. Lea, F. E. S., Government Entomologist of Tasmania. Council of Agric., Tasmania, 1908.

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## Doings of Societies.

A meeting for organizing an entomological society to promote an interest in Entomology and allied subjects in this State was held in the offices of the Providence Forestry Co., Union Trust Co. Building, at Providence, R. I.

By a vote of the nine members present it was decided to call the organization the Rhode Island Entomological Society.

A Constitution was read and adopted, and after this, the election of officers took place, which resulted as follows:

*President*, Prescott D. Reynolds; *Vice-President*, Arthur H. Kingsford; *Secretary*, William Place, Jr.; *Treasurer*, H. F. Edy.

After a brief discussion regarding the sight of ants, the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

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The Brooklyn Entomological Society met Jan. 8, 1909, at 55 Stuyvesant Avenue, with President Pearsall in the chair and thirteen members present.

C. L. Pollard, M.A., curator of the Staten Island Museum was elected an active member.

The election of officers followed. Mr. Pearsall refusing re-election. Prof. John B. Smith was unanimously chosen president; Geo. P. Englehardt, vice-president; Chris. H. Roberts, treasurer for his 31st consecutive term. As Mr. Roberts is



still a comparatively young man we are confident that in time he will surpass the remarkable record now held by the revered treasurer of the Philadelphia Society, Mr. Ezra T. Cresson; R. P. Dow, recording secretary; A. C. Weeks, corresponding secretary, which position he has held for over a quarter of a century; Geo. Franck, curator; Wm. T. Bather, librarian.

It was voted to appoint a committee of five to regulate the valuable library which the society possesses, make a card catalogue, bind wherever necessary and make it of the greatest possible practical use. It was then voted that E. L. Graef, the veteran lepidopterist whose collection including all types, graces the Brooklyn Institute Museum, be elected honorary president of the society.

The personnel of the society has changed much during the past three years. The old guard, who were members when the Bulletin and Entomologica Americana were in their glory, are faithful, but recent elections have been largely young men who are collectors and not necessarily masters of the principles of fundamental entomology. The policy of the society has now been changed to meet present conditions. There is to be an educational keynote running through the future programs, and practical demonstration is to figure.

Under the head of scientific discussion Mr. Englehardt exhibited a collection of mimetic or protectively colored forms which he collected last summer in Guatemala. A series of Syntomidae showed remarkable resemblance to the wasps of the genus *Polybia*. The species of the genus *Ageronia* which rest on tree trunks with wings expanded were fine examples of protective coloration of upper wing surfaces. He showed also a good variety of mimetic *Papilio*, *Pieris* and *Heliconius* and protected *Caligo*, *Satyrus*, *Victorina*, etc.

R. P. Dow, *Recording Secretary*.

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A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held Thursday, January 21st, at the John Crear Library. Nine members present.

The Recorder read an announcement of the death of Dr.

Martin Matter, who attended the meetings occasionally. He was spoken of very highly as a sincere friend of nature study. He was best known in the Entomological Section for the interest he took in the study of ants, their habits, etc.

Messrs. Beer and Kwiat exhibited their collections of Limacodidæ. These included the following species taken in the Chicago Area :

<i>Euclea elliottii</i>	<i>Heterogenea shurtleffii</i>
" <i>paenulata</i>	<i>Prolimacodes scapha</i>
<i>Adoneta spinulodes</i>	<i>Limacodes biguttata</i>
<i>Sisyrosea textula</i>	" <i>rectilinea</i> var. <i>latomia</i>
<i>Lithacodes fasciola</i>	" <i>Y-inversa</i>
" var. <i>laticlavata</i>	<i>Tortricidia flexuosa</i>
<i>Packardia albipunctata</i>	" <i>testacea</i>

There was also another *Tortricidia*, closely resembling *flexuosa*, but much paler, fresh specimens being more of a smooth, cream yellow, as compared with the yellowish brown of *flexuosa*. The primaries also are distinctly wider and shorter with the apex less produced than in *flexuosa*. Both sexes were represented and quite a number of specimens, all having been taken in the sandy region around Hessville, Indiana, where they appear a little later as a rule than *flexuosa*.

Another interesting specimen exhibited by Mr. Kwiat was a *Packardia*, which he is almost convinced is a new species. Nothing like it seems to have been described. In style and marking it is like *albipuncta*, but instead of a whitish ground color on the primaries, this is smooth, yellowish brown, the basal space and outer margin being without clouds or suffusion of any kind, the space between the transverse lines filled solidly with a blackish blue color. The white spots appear as in *albipuncta*. Secondaries black.

Messrs. Healy and Henneberger reported the capture on May 30, 1908, at Glen Ellyn of *Thyris lugubris*. This is a new species for this vicinity.

Mr. Liljeblad exhibited several boxes of Coleoptera just received from Austria. Their excellent condition elicited comment.

Mr. Wolcott exhibited his series of local Haliplidae, the species represented being:

*Haliphus triopsis*, Say.

" *cribrarius*, Lec.

" *nitens*, Lec.

*Haliphus ruficollis*, DeG.

" *longulus*, Lec.

*Cnemidotus edentulus*, Lec.

He stated that while the number of species equals those recorded in the Ulke list of Washington, D. C., only two *H. triopsis* and *H. ruficollis* are common to the two regions. Mr. Wolcott also exhibited a specimen of *Purpuricenus humeralis* with three tibiae and tarsi on left fore leg. Also a few rare species including *Nothopus sabroides* and *Ips obtusus*, Say.

ALEX. KWIAT, *Recorder*.

At the meeting of the Feldman Collecting Social, held December 16, 1908, at the residence of Mr. H. W. Wenzel, No. 1523 South Thirteenth Street, Philadelphia, there were fourteen members present.

Mr. Harbeck stated that he had taken specimens of *Eugnoriste occidentalis* Coq. on golden rod, at Trenton, N. J. The localities given for this species in Aldrich's list are Las Cruces, N. M. and Moscow, Idaho.

Mr. H. W. Wenzel reported that he had seen specimens of *Tenodera sinensis* in numbers in many places at Anglesea, N. J. in 1908, from July to September.

Prof. Smith said that he had egg-masses of the same species put out from Orange Mountains to Burlington County, and at not a single place have they established themselves; individual specimens have been found here and there, showing that they have just only maintained themselves. Prof. Smith also spoke of his observations on the flea beetle, *Chaetocnema confinis*; this species hibernates in adult stage, the larvæ and pupæ are found in roots of bindweed, and as soon as foliage appears on sweet potato, the larvæ attack this plant, making channels on leaves, which kill the vines. They disappear by middle of June.

Mr. H. W. Wenzel spoke of collecting many Coleopterous species on different plants than upon those in or on which they

breed, referring particularly to species of *Leptura*, *Xylene*, *Lebia*, etc.

Mr. Harbeck said he had recently seen great numbers of *Cicindela dorsalis* on decomposing meat at the seashore. Mr. Harbeck also stated that he had found that by allowing Tipulids to dry before pinning, and relaxing them after they had dried, the legs were not so apt to drop off. Mr. Daecke suggested touching of base of legs with a thin solution of glue to prevent legs dropping off.

Mr. Charles Greene said that he had put two tipulid larvæ in a box, and that one of the larvæ ate the other.

Dr. Skinner spoke of some bag worm larvæ which he collected in the Huachuca Mountains, but which he was not able to raise; they were evidently a new species. Dr. Skinner also referred to a lecture by Dr. F. C. Wellman, the African explorer, in which the lecturer laid stress upon the importance of entomological training, and especially the working out of the metamorphosis of insects, so as to be able to prevent the distribution of disease by the knowledge of their life habits.

FRANK HAIMBACH, *Secretary*.

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At the twenty-first annual meeting of the Feldman Collecting Social held January 20, 1909, at the home of Mr. Wenzel, 1523 S. 13th St., Philada., the following members were present: Prof. John B. Smith, Dr. Castle, Messrs. Daecke, Seiss, Laurent, H. W. Wenzel, H. A. Wenzel, Hoyer, Kaeber, Harbeck, Haimbach, Huntingdon, C. T. Greene, Geo. M. Greene and last but not least we enjoyed the presence of our honorary member Mr. James H. B. Bland, the first president of the Feldman, whose visit though unexpected to most of us was most opportune as to-night is the one on which the social becomes of age.

President Daecke in the chair.

The minutes of the previous meeting were read and adopted.

The president read his annual address, which was ordered to be incorporated in the minutes.

The following officers were elected to serve during the year 1909:

H. Harbeck, President; F. Haimbach, Vice-President; H. W. Wenzel, Treasurer; Geo. M. Greene, Secretary; Chas. T. Greene, Asst. Secretary.

Prof. Smith remarked that in importations from France nests of Brown Tail Moth had been introduced into New York and New Jersey, and was more injurious in countries where introduced than its native home. The parasites of this species do not adapt themselves to this country as well as the host. Same speaker said he had heard of a nursery where peonies were so spotted by some insect as to become unsalable so he sent someone to investigate and found blue bottle flies in uncountable numbers. About a quarter mile away was found a field where scrapings from skins of pigs were placed and allowed to decay so the bristles could be used. This entire field of about one-half acre was covered with maggots—the species were of the genera *Calliphora* and *Lucilia*.

Mr. Wenzel stated Mr. Seeber had years ago found a similar field up Second street where he collected many species of *Trox*. Said it would be a great spot for small Silphidae and Nitidulidae.

Mr. Daecke said he had found the collections of the Harrisburgers mostly undetermined but had noticed many interesting Diptera, some species exceedingly common there are rare here. Said he had noticed very good collecting places in the immediate neighborhood.

Mr. Wenzel exhibited specimens of *Colaspoides violaccipennis* collected by H. A. Wenzel and Kaeber in Huachuca Mts., Ariz., in July. This species was described by Dr. Horn from 2 ♀, exact locality unknown but possibly from Southern Arizona. Also exhibited a specimen of *Microdon globosus* Fabr. collected at Castle Rock, vi-13, a species of Diptera rare in this State.

Geo. M. Greene exhibited a longicorn, *Petrognatha gigas* Fabr. from Congo River, and a Buprestid, *Julodus acquinotialis* Gray, from Sahara Desert.

GEO. M. GREENE, *Secretary*.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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### Notes and Descriptions of Crabronidae.

By S. A. ROHWER, Boulder, Colorado.

**Rhopalum modestum** Roh. [ENT. NEWS, June 1908, p 257].

I have seen two males of this species from Milwaukee Co., Wisconsin, July 27, 1907. They belong to the Public Museum of Milwaukee and bear the number 25,492. They differ from the type as follows: The middle lobe of the clypeus is not so acute and is broader; and the scape is entirely yellow.

♀. Length 6 mm. More robust than the male. Anterior margin produced in the middle into an acute narrow tooth, with a small, distinct, sharp tooth laterally. Distance between the eyes at the clypeus not as great as the width of the clypeus, counting the middle lobe. Space between the antennae distinctly greater than the space between the antennae and the eye margin. Fourth joint of the antennae twice or a little more than twice as long as the third and distinctly longer than the fifth; second and third joints of equal length; antennae simple. Furrow from lower ocellus not very strong. Depressions near lateral ocelli about the same as in *R. pedicellatus* Pack. Distance between the lateral ocelli about the same as that to the nearest eye margin; ocelli in a triangle. A low raised carina in the middle of dorsulum. Head and thorax shining, with rather close fine punctures. Metathorax without a basal enclosure; with a distinct, deep, longitudinal furrow, which broadens on the posterior face; sides of posterior face bounded by

strong carinae. Legs robust; posterior tibiae clavate toward apex; four posterior tibiae slightly spinose, the posterior one being serrated also. Abdomen shining, highly polished. Petiole grooved above basally; the node glabrous; petiole in front of the node not quite as long as the second segment. Pygidium excavated, narrowed apically; apex rounded. Black; mandibles piceous; scape in front, tubercles, anterior legs below apex of femora, four posterior knees and intermediate tarsi yellow; trochanters brownish; tegulae testaceous. Wings clear hyaline, iridescent, venation black.

A female belonging to the Public Museum of Milwaukee, collected in Milwaukee Co., Wis., Aug. 12, 1907. No. 24,301.

This species is near to *R. pedicellatus* Pack, but the longer third antennal joint; the absence of the basal enclosure of the metathorax, and the black coxae will separate it at once in the female sex. The male was separated in the original description.

I have bred this species from pupae in old stems of the cultivated currant (*Ribes*). A ♂ hatched April 27, 1907.

**Grabro (Protothyreopus Ashm.) dilectiformis** n. sp.

♀. Length 14 mm.; width of head 3.5 mm. Robust, stout. Clypeus with a strong medial carina at the apex of which is an obtusely rounded tooth; the apical margin smooth, without hairs. Space between the eyes at the clypeus a little less than the width of the clypeus, including the rounded tooth. Facial basin smooth, shining. Third joint of the antennae equal to the length of the antennal joints 4 and 5. Ocelli in a low triangle. Space between the lateral ocelli less than the distance from one of them to the nearest eye margin. There is a faint indication of a carina from between the lateral ocelli to the occiput, it is much stronger between the ocelli than elsewhere. Head rather finely, closely punctured, the punctures are sparser on the cheeks and occiput. Pronotum in front strongly, longitudinally striated; not very strongly, but distinctly ridged anteriorly, dentate laterally; broken in the middle. Dorsulum rather coarsely, closely punctured, the punctures becoming a little sparser posteriorly. Mesoplurae above striate, below striato-punctate. Scutellum striato-punctate. Postscutellum sparsely punctured. Metanotum coarsely, longitudinally striated; with a deep central furrow, posterior face not so coarsely or closely, transversely striated, with a deep central furrow. Metaplurae finely, transversely striated, more coarsely so anteriorly. Anterior femora triangular, keeled above posteriorly. Four posterior tibiae serrate. First recurrent nervure a little more than half the length of the first transverse cubitus basad of the cubitus. Abdomen closely punctured, first segment more strongly

and sparsely so, last ventral segment strongly punctured. Pygidium triangular, slightly depressed apically; strongly punctured. Black; mandibles (apices piceous), scape, two large spots on the pronotum, tubercles, elongate spot beneath tegulae, two small spots in front of the scutellum, postscutellum, elongate spots on the first three dorsal abdominal segments, bands on the fourth and fifth, *yellow*. Tegulae femora beneath *rufo-testaceous*; apices of femora above, tibiae and tarsi *yellow*, apices of tarsi infuscated. Wings smoky-yellowish; venation testaceous.

*Habitat*.—Milwaukee, Co., Wis., Aug. 13, 1905. Type in the Public Museum of Milwaukee.

In my table for the females of this group (Ent. N. June, 1908, p. 250) this species runs to *dilectus* cress., but the striato-punctate scutellum and the reddish femora separate it at once from this species. *Bigeminus* Pack., *dilectus* Cress. and *dilectiformis* Roh. may be grouped together because in the female sex the pygidium is slightly, but noticeably depressed apically. They may be separated as follows:

Scutellum striato-punctate (femora partly rufous; metathorax black.

*dilectiformis* Roh.

Scutellum punctured . . . . . I.

1. Metothorax without a yellow spot; basal half of femora black.

*dilectus* Cress.

Metathorax with a large yellow spot; femora pale beneath. *bigeminus*.

### ***Crabro banksi* n. sp.**

♀. Length about 9.5 mm. Anterior margin of the clypeus semi-circular, not produced or emarginate; carina evident, but not strong. Space between the eyes at the clypeus about the same as the width of the clypeus in the middle. Facial basin thickly covered with pubescence, with a shining, longitudinal line in the middle; not sharply defined above. Interorbital foveae present, elongate, but not strongly defined. Ocelli in a low triangle; distance between the hind pair equal to or slightly greater than the distance between one of them and the nearest eye margin. Below the ocelli the head is closely punctured with medium size, distinct punctures; above the ocelli the punctures are larger and rather widely separated. Antennae with short, rather sparse silvery pile; the third joint a little shorter than joints 4 and 5. Pronotum short, with a very weak transverse carina anteriorly; not dentate laterally. Dorsulum compactly, rather coarsely punctured, three longitudinal carinae anteriorly, the middle one the weakest. Scutellum with large, punctures, separated anteriorly, confluent in places posteriorly. Mesoplurae distinctly striato-punctate. Metanotum rather finely,



obliquely, irregularly striated, a middle channel which is foveolated. Posterior face separated from the metanotum by a somewhat indistinct fovea; bounded laterally by faint carinae; a triangular fovea; rather finely rugose. Metapleurae very finely transversely striated. Legs normal; hind basitarsus as long as the remaining tarsi. First dorsal abdominal segment with large separated punctures; second and third dorsal segments with smaller more widely separate punctures, those on the third segment smaller and fewer; the remaining dorsal segment with smaller, sparser punctures. All the ventral segments with a transverse punctured, apical line, apical segment with close large punctures. Pygidium deeply channeled, excavated posteriorly, with a lateral fringe of stiff hair. Color black; spot on mandibles, scape and pedicellum, two transverse spots on the pronotum, tubercles, spot under the wings, spots on the lateral, anterior corners of the scutellum, postscutellum, stripe on the four anterior tibia outwardly, posterior tibia except apex, tarsi, lateral spots on second, third and fourth dorsal segments, a band on the dorsal fifth, *yellow*; tegulae testaceous. Wings sub-hyaline; venation brown. Clypeus and facial basin with silvery pubescence; head and thorax with long grey hair.

*Habitat*.—Virginia, Glencarlyn, July 26; Great Falls, July 31. Type from Glencarlyn. Named after Mr. N. Banks, who collected the specimens.

This species seems to connect Fox's groups *scaber* and *chrysarginus*. The sculpture of the head is that characteristic of group *scaber*, while the lateral fringe of the pygidium is that of group *chrysarginus*. In Fox's table it runs to 19, where it goes out because of the coarsely punctured head and fringe of the pygidium. If the pygidial fringe be discarded it would go to *stirpicolus* Pack., but it is not that species. If the sculpture of the head should be discarded it would go to *odynecroides* Cress., but is widely different from that species. *C. banksi* does not fit any of Ashmead's genera, but comes in with *Pseudocrabro* Ashm. and *Xylocrabro* Ashm.

**Crabro (Protothyreopus) megacephalus Roh.**

A ♂ from Florissant, Cal., June 14, 1903, on sand (S. A. Rohwer), seems to be the male of this species. It differs from the ♀ as follows:

Pronotum not so strongly dentate, but more keeled anteriorly and somewhat sharper at the angles; posterior face of metathorax more strongly transversely striated; mesopleurae more strongly striated; punc-

tures of abdomen sparser; not so strongly covered with pubescence. Length 8 mm.

The ♂ is related to *C. dilectus* Cress., but may be separated by the following characters:

Head and dorsulum not nearly so strongly sculptured; basin around lower ocellus and furrow from lower ocellus more distinct; mesoplurae more strongly striated; posterior face of metathorax more distinctly striated; punctures of abdomen finer.

**Crabro** (*Synothyreopus* Ashm.) *florissantensis* n. sp.

♂. Length 7 mm.; length of anterior wing 4.5 mm.; length of abdomen 4 mm. Slender. Head closely, rather finely punctured with a number of longitudinal striae intermixed; at the top of each eye is a smooth area. Ocelli in a low triangle; the distance between the two lateral ones slightly less than the distance to the nearest eye margin. Antennae moniliform; apical joint decidedly longer than preceding. Clypeus slightly produced in middle, a small tooth at each side of this projection. Pronotum rounded, neither carinate or dentate. Anterior part of dorsulum finely, closely punctured with some large punctures intermixed; posterior part of dorsulum distinctly longitudinally striated. Scutellum very finely, longitudinally striated. Suture of mesoplurae foveate; sides of mesoplurae impunctate, or very finely punctured. Metanotum with a distinct longitudinal carina which extends on posterior face, above these are a number of rather irregular striae. Posterior face of metathorax bound by distinct ridges; divided in middle by the carina above mentioned. Metaplurae finely, closely, transversely striated; at the top there are a number of strong striae. Anterior trochanters not half as long as femora; anterior femora, flattened and strongly produced posteriorly, more strongly so at base, that produced part at the posterior basal angle has a stout hook; shield of anterior tibiae about a third wider than the length of the tibiae, about parallel-sided for the first third of the way then it tapers to an obtuse point. Venation normal. Abdomen long, slender, impunctate. Black; two spots on pronotum, scutellum, postscutellum, two spots of all the dorsal abdominal segments (forming a band of the first, fifth and sixth), spot of apex of anterior femora, and a line on anterior tibiae yellow. Apical third of shield brown, the rest greenish-brown, with many hyaline, round spots. Clypeus with silvery pubescence. Head and thorax covered with long black hair. Wings slightly dusky hyaline, venation pale brown.

*Habitat*.—Florissant, Colo., June 12, 1908, "on sand," (S. A. Rohwer).

This species is not closely related to any described American species. It seems nearest to *tumidus* Pack., but the sculpture of the head and thorax is different, the mandibles and scape are black and there are many other differences.

The particular fore femora would perhaps be ground for making a new subgenus for it, but I believe there are already more subgenera than are necessary.

**Crabro (Thyreopus) lacteipennis** n. sp.

♀. Length 8.5 mm. Rather slender. Anterior margin of the clypeus rounded out, not dentate or emarginate; no clypeal carina. Head with distinct somewhat separate punctures. Ocelli in a low triangle; the distance between lateral ocelli greater than the distance to the nearest eye margin; no furrow from the anterior ocellus. Scape long, so that the flagellum is not twice as long as it is; third antennal joint but little longer than the fourth. Pronotum rather long, not furrowed either transversely or longitudinally; lateral angles sharp, but hardly dentate. Dorsulum and scutellum with distinct, separate punctures. Mesoplurae with more widely scattered punctures, the furrow not foveolated. Metanotum with a shallow middle furrow, obliquely striated. Metaplurae finely striated; posterior face with a few indistinct transverse striae; fovea elongate distinct; lateral carinae not strong, hardly extending to the middle. Four hind tibiae rather strongly spinose on the outer margin. Venation as in *tumidus* Pack. Abdomen impunctate, rather elongate. Pygidium broad, triangular, rounded at the apex, covered with long hair. Color black; mandibles in middle and tegulae reddish, scape in front, two spots on pronotum, tubercles, spot on the anterior femora apically, all the tibiae exteriorly, postscutellum, wedge shape spots on all the abdominal dorsal segments, (the second and third sinuate), *whitish*. Clypeus, cheeks, and face above the level of the antennae with dense silvery pubescence; the rest of the insect nude. Wings milky-hyaline, iridescent; venation pale testaceous.

*Habitat*.—Unknown, but perhaps Denver, Colo. (S. A. Johnson).

This species should be known at once by the milky-pyaline wings. In Fox's table it falls near *tenuiglossus* and *tumidus*.

**Crabro (Blepharipus) tridentatus** n. sp.

♀. Length 7 mm. Anterior margin of the clypeus very slightly produced into the middle, with three distinct obtuse teeth; middle carina present but not strong. Eyes large, converging strongly towards the clypeus so they are quite as wide at the clypeus as the width of the clypeus in the middle. Head shining, with five scattered punctures.

Ocelli in an equilateral triangle; a very strong furrow from anterior ocellus. Facial basin not bounded by a carina. Superorbital fovea elongate, not parallel with the eye margin; deep, well defined. Third antennal joint distinctly longer than the fourth. Pronotum rounded, slightly notched in the middle. Dorsulum with small distinct punctures; longitudinally impressed in the middle, the impression with a longitudinal carina. Scutellum with a few elongate punctures posteriorly. Mesopleurae shining, with sparse punctures; furrow distinctly foveolated. Metanotum with two shining convexities, separated by a furrow which broadens at the postscutellum. Metapleurae shining, impunctate; posterior face shining, with an elliptical fovea; lateral ridges rather strong, extending above the middle. Legs and venation normal. First abdominal segment narrowed basally; abdomen shining, impunctate. Pygidium narrowed apically, basally with a few large punctures. Color black; scape beneath, line on pronotum, legs below femora and tips of anterior femora *bright yellow*; tegulae and apical margins of abdominal segments *testaceous*. Wings hyaline, iridescent, venation black. Clypeus, cheeks, and pectus with silvery pubescence.

♂. Length 6 mm. Clypeus more produced than in ♀ and with two small lateral teeth, on the produced portion; apex of produced portion rounded; carina almost wanting. Punctures of the head larger than in ♀. The scape is not as yellow, and the yellow on the pronotum has a tendency to divide; apex of the hind tibiae black. The testaceous bands of abdomen are wanting. Head and thorax clothed with fuscous pubescence.

*Habitat*.—Falls Church, Va. and Washington, D. C., May 30, June 16, July 19, Sept. 11 and 29. (N. Banks).

This species is very near *impressifrons* Sm., but the tridentate clypeus of the female, and the obtusely rounded produced portion of the male will at once separate it from that species.

**Crabro (*Lindemius*) *zellus* n. sp.**

♀. Length about 5 mm. Anterior margin of the clypeus broadly truncate, with two lateral teeth, the inner one the stronger; no carina. Mandibles simple at the apex. Head shining, with small punctures. Facial basin not bounded by a carina above. Superorbital fovea oblique, not strong. Ocelli in a low triangle, an impressed line above and below the anterior ocellus. Flagellum short, not twice the length of the scape. Pronotum lower than the dorsulum, transverse, sharply truncate before. Dorsulum shining, with distinct separate, small punctures; not impressed. Scutellum similarly sculptured. Mesopleurae, with small distinct punctures; furrow strongly foveolated, straight. Metanotum distinctly obliquely striated; separated from the posterior face by a

carina which in the middle extends down around the fovea of the posterior face. Metapleurae shining impunctate; posterior face finely punctured; lateral ridges well defined. Legs and venation normal. Abdomen shining, microscopically punctured. Pygidium broad triangular, punctured apically. Color black, mandibles (apices piceous), clypeus, scape, pedalicum beneath, tubercles, two spots on pronotum, spot on scutellum, four anterior legs below knees except a line within on middle tibiae, posterior tibiae at the base and their tarsi yellow. Wings hyaline, iridescent; venation black. Usual silvery pile.

*Habitat*.—Falls Church, Va., July 14. (N. Banks).

A distinct species, in Fox's table it runs to *flavicypeus* Fox, but that species has the enclosure of the metathorax "divided by a very wide, longitudinal channel."

**Grabro (*Epicrossocerus*) *universitatis* n. sp.**

♀. Length 4 mm; length of anterior wing 3 mm. Anterior margin of the clypeus with a large lateral tooth; medially produced into to a broad, low lobe in the middle of which is an obtuse tooth. Seen from in front there is a sharp tooth at each side of the clypeus, below the eye margin. Seen from the side above the lower margin of the cheek, from the eye outward, is strongly keeled; this keel is wavy on the outer margin and presents three more or less distinct teeth. From lower ocellus extending downward to the clypeus and upward nearly to the occiput is a distinct furrow. At the upper inner eye margin there is a distinct ovate fovea. Ocelli in an equilateral triangle. Head shining, apparently very finely punctured. Pronotum slightly, but sharply, keeled anteriorly; angulate laterally, sides much straighter than usual. Dorsulum and scutellum finely closely punctured, not so shining as the head. Mesopleurae punctured like dorsulum; a circular fovea in about the middle; episternal furrow nearly straight, not very strongly foveolated. Metathorax finely closely punctured, without an enclosed area or shining convexities; posterior face with a shallow rather broad fovea; suture between the postcutellum and the metathorax strongly foveolated. First rec. nerve in the middle of the first cubital cell. Anterior trochanters broadened apically, not quite half as long as their femora; posterior tibiae serrate on outer margin; first joint of posterior tarsi about equal to 2 plus 3 plus 4. Abdomen shining, impunctate. Pygidium narrowed apically, excavated; somewhat roughened.

Black; mandibles, except the rufous apex and scape, except above, yellow. Tegulae and all the tibiae and tarsi testaceous; the tibiae are somewhat brownish. Wings hyaline, strongly iridescent; venation black-brown. Clypeus with silvery pubescence, insect otherwise nude.

*Habitat*.—Campus of the University of Colorado, Boulder, Colo., July 25, 1908. ( *T. D. A. Cockerell* ).

The prothorax beneath has a sharp tooth at each lateral angle.

In Fox's Monograph on N. Am. Crabronidæ this species runs to *insolens* Fox (Colo.), but it differs from that species in the following characters: Space between the hind ocelli not greater than the distance to the nearest eye margin, if anything slightly less; there is a distinct impression extending to the lower ocellus; pronotum without a "strongly marked, transverse impression on each side," crest of pronotum not highest medially; larger size, etc.

*C. insolens* Fox is the type of Dr. Ashmead's genus *Epicrossocerus*. Dr. Ashmead apparently had not seen a ♀ of *insolens* as he only separated his genus, *Epicrossocerus*, from the males. Fox's type of *insolens* is a ♀, and as far as I know no male has been seen.

If *Epicrossocerus* Ashm. is to be recognized as a subgenus or section, and I think it may be separated from *Crossocerus* Lep. and Brul. by the narrowed and excavated pygidium of the ♀. The ♂ will probably be difficult to separate from the males of *Crossocerus*. *Epicrossocerus* is nearer *Blepharipus* Lep. and Brul. than it is to *Crossocerus*. It may be known from *Blepharipus* by the keeled pronotum, dorsulum without median depression, short abdomen, almost square head, and containing species of a smaller size.

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DURING a brief stay in Thomasville this Christmas I was much surprised on December 26th to meet with a single specimen of *Heliconius charitonius*, flying through the pine woods. A year before, at about the same time, I met with *Megathymus yuccae*, flying about a portion of the golf course. Both of these records were very unexpected, as a few years ago I collected constantly for several seasons from November to April without finding the least trace of either of these species. Specimens of both species which I secured were so fresh that I can hardly believe they had come from any considerable distance. This season the fall weather had been particularly mild and many *Eudamus proteus*, *Dione vanillae*, *Catopsilia eubule* and other distinctly warm weather species were on the wing, and usually in good condition.—MORGAN HEBARD.

## Migrations of *Athena chiron* Fabricius

BY FREDERICK KNAB, Washington, D. C.

Throughout the greater part of tropical and subtropical America *Athena chiron* is, at certain seasons, one of the most abundant butterflies. It may often be seen congregated in large numbers at puddles or wet spots of ground to sip moisture. During our stay at Cordoba, Mexico, Dr. Fenyès and the writer witnessed an extensive migration of this species. Our observations extended over four days, May 15-18, 1908, and were brought to a close by the departure of the writer. It is to be supposed that the migration continued for some time after, while the conditions prevailed which favored it. The butterflies did not form a swarm but were traveling independently. Numbers of them could be seen scattered over the countryside, many of them flying in a northeasterly direction, while others hovered about bushes and herbage or about moist places. In town they could be seen rapidly passing over, just above the roofs of the houses. There were some almost constantly in sight from our station in the courtyard of our hotel. The flights ceased during periods of cloudiness, only to be resumed when the sun again appeared.

The appearance of these butterflies at Cordoba in such large numbers was due to their sudden development in the adjoining hot, low regions as a result of the first rains of the warm season. The steady currents of heated air, passing up the mountain sides from the valley of the Rio Blanco, carried these butterflies along with them. It would therefore seem that the migration was due to natural causes rather than to any purpose or migratory instinct on the part of the insect.

Godman and Salvin observed a migration of a like character, and under similar conditions, in this same species of butterfly, near San Geronimo, in Guatemala. As their account, in the *Biologia-Centrali Americana* (Lepid, Rhopal., vol. I, p. 289) is accessible to but few readers, I quote it here:

"We were riding one afternoon down the mountain side skirting the plain of Salama, when we met thousands of this species, which were flying with the wind along the hillside. All were going in the same direction, which took them to the higher ranges of this district, and beyond into the valleys of the Polochic and Motagna."

## Additional Notes on the Orthoptera of the Keeweenaw Bay Region of Baraga Co., Mich.

BY MORGAN HEBARD.

In the Entomological News for September and October, 1904, Mr. J. A. G. Rehn published a paper on the Orthoptera of this region based on material which had been taken by me during the summer of 1903. Since that time, a few weeks spent in the same region\* during the summers of 1904 and 1905 have netted these additional results. Mr. Rehn has kindly assisted me in the preparation of this paper.

### ACRIDIDAE.

#### **Acrydium granulatum** Kirby.

July, 1904, 1905. Woods, swamps, marsh, open country. Forty-four specimens. Two approach *A. luggeri* closely.

#### **Acrydium luggeri** (Hancock).

July 30, 1904. Marshy. 1 female.

#### **Acrydium acadicum** (Scudder).

July 17, '04; on sawdust; one female; Ravine River, Mich.

July 19, '04; on pebbly bar in stream; one male; two females.

July 24, '05; marsh; 1 female. This species was always found to be scarce.

#### **Stauroderus curtipennis** (Harris).

Always very plentiful from the middle of July to the beginning of cold weather. Twenty-three specimens were taken.

#### **Chloealtis conspersa** Harris.

July 13, 14, 16, 17, 18, 25, 28, 1904. Forty-three specimens.

July 24, August 1, 1905. Eight specimens.

One female (July 17, '04) is a representative of the long-winged form *prima* Morse. The tegmina in this specimen exceed the apex of the abdomen by slightly more than the length of the pronotum. The species was found most frequently among dead leaves in openings in the woods. Many males, however, were taken about brush heaps and thickets in open pastures.

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\*All the specimens were taken near Pequaming, Baraga County, Michigan, unless otherwise stated.



***Mecostehus gracilis* (Scudder).**

Twenty-four males, two females. August 1, 2, 1905.

I found these specimens in the same clearing in which I took a series of the species in 1903. Nowhere else was the species to be found. The insects were all fresh and the collecting proved that this species does not appear in any numbers until the beginning of August.

***Camnula pellucida* (Scudder).**

This species appears about the middle of July and is plentiful in grass fields until the advent of cold weather. Twenty-one specimens were taken.

***Dissosteira carolina* (Linnaeus).**

A common species, especially along dusty roads, appearing toward the end of July. Two specimens were taken, July 29, 1904.

***Cercotettix verruculatus* (Kirby).**

July 16, 17, 28, 29, 30, 1904, July 24, 1905. Twenty specimens were collected, two of which were immature (July 24, '05, July 28, '04). On any warm sunny day in late July or in August many specimens of this species could be heard "crackling" about the lumber yards and town.

***Podisma glacialis canadensis* E. M. Walker.**

Four males, three females and one nymph were taken on August 3, 1905. The insects were all taken from hazel bushes which are scattered through high pastures of the L'Anse et Vieux Desert Indian Reservation. The specimens were taken only by constant and vigorous search during the greater part of the day. The species is probably quite scarce at all times.

***Melanoplus islandicus* Blatchley.**

July 13, 14, 16, 17, 26, 28, 30, 1904, and July 24, 1905. Thirty-eight males, thirty-nine females, two nymphs (latter both taken July 16). I did not discover the favorite habitat of this species until 1904, which accounts for my considering it very scarce in my note in Mr. Rehn's paper. It was found plentiful in but one spot about Pequaming. This was in a growth of small hardwood trees, where the series were taken in both 1904 and 1905. On the whole I should consider the

species scarce and very local in distribution, since three years' collecting in the woods about Pequaming failed to reveal but this one colony of the species, although two specimens were taken in a nearby meadow. The series is rather uniform in size, and such variation in color as exists consists chiefly in the replacing of vinaceous browns by darker tones.

**Melanoplus huroni** Blatchley.

One male of this species was captured in the woods on August 1, 1905, in the vicinity of the spot where *M. islandicus* was found plentiful. This species is easily the scarcest of the *Melanopli* I have collected about Pequaming.

**Melanoplus extremus** (Walker).

July 13, 16, 17, 28, 29, 1904, August 1, 2, 3, 1905.

Ten males, sixteen females. One male and one female belong to the long-winged type (*scandens* Scudder), while several other have the tegmina but little shorter. The specimens were taken in meadows, woods and swampy situations.

Skaneec, Michigan, July 22, 26, 1904.

Five males and four females were taken in a clearing overgrown with rank grass, two miles in the woods.

The species was never found in numbers excepting in the last mentioned locality, and may be said to be a scarce species. It was found always to prefer damp meadows where grass was luxuriant and deep. The small number of specimens taken in 1903 is to be accounted for by the fact that I believed the species to prefer the upland clearings, and did not search for it in the lower meadow portions.

**Melanoplus fasciatus** (Walker).

July 16, 17, 30, 1904, July 24, August 1, 3, 1905. Five males, five females. One male (July 17, '04) and one female (July 24, '05) belong to the long-winged type (*volaticus* Scudder), while one female (July 30, '04) has much longer wings than the usual type. Half of the specimens are of a brownish cast, the others overclouded with blackish. The species was never found except singly, and was taken in most cases in the open, but also in meadow land and nearby situations.

**Melanoplus bruneri** Scudder.

Three males, one female. July 24 and August 1, 2, 1905. This interesting species was found in meadow land in rather scarce numbers.

Two males and seven females of this species taken about Pequaming on July 22, August 1, 3, 5, 6, 21 and 31, 1903, were inadvertently placed under *M. atlanis* by Mr. Rehn in his article in the Entomological News of October, 1904, the other specimens recorded being true *Melanoplus atlanis*. This is the first record of this species from Michigan, and the second record of the species from east of Minnesota, the other record being from the Muskoka Lake region, Ontario.

The females may be readily separated from males of *Melanoplus atlanis* by their more robust and less attenuate shape and wider and more abbreviated tegmina. The single female captured on July 22 had but recently become adult, and the condition of the other specimens indicates that the species probably does not appear in its full strength until the beginning of August.

**Melanoplus femoratus** (Burmeister).

July 16, 25, 28, 1904, and August 1, 2, 1905. Seven males, three females. All of the specimens were taken in meadow lands where the species were abundant, as well as among the "brakes" on the edge of the forest.

**Xiphidion fasciatum** (DeGeer).

One male, one female, one nymph, taken on August 1, 1905. Plentiful in marshy places in the woods and fields.

**Ceuthophilus terrestris** Scudder.

July 14, 16 and 17, 1904. Taken under the same stones in the Indian war-dance ground where I took ten specimens in 1903. Thirty-four specimens of this species were collected. One specimen, taken on July 17, was captured in the act of moulting to the full imago, while another, taken on July 14, is seen to be freshly transformed from the last pupal stage, and has not taken the full coloring. Nowhere else was this species to be found, although diligent search was made.

July 28, 1904. One male of this abundant species was captured in a swampy situation.

## Two Fossil Bees.

By T. D. A. COCKERELL.

The numerous bees from Baltic amber which I have recently had occasion to study, all belong to extinct genera. In this they differ from some of the other amber Hymenoptera, which belong to genera still living, e. g., *Pison*, *Crabro* and *Hadronotus*. The bees are believed to have arisen from the fossorial wasps, and no doubt many wasp-genera are of great antiquity. The amber insects are of Oligocene age and are possibly as much older than those of Florissant, as the latter are than those now living. The Florissant bees include both living and extinct genera; the latter not ancestral, apparently, to any now existing. During Miocene times, this country had a warmer climate than at present, and doubtless supported a larger insect fauna. Later, especially at the time of glaciation, the fauna must have been greatly reduced, and it appears that many genera became extinct;—some entirely so, others (as the tsetse fly) surviving on other continents. Even the warm period was probably fatal to many old American genera, because it permitted the immigration of numerous old-world forms via Alaska, and thus set up injurious competition. The details of the great Tertiary biological drama are gradually being made out through a study of the fossils, and it is becoming increasingly evident that these must be considered in connection with the living genera, in order to understand the one or the other series. Most students of recent insects have heretofore ignored the results of the palæontomology, but it is hoped that in the future they will gladly utilize the significant facts available from this source.

### **PELANDRENA** gen. nov.

Allied to *Andrena*, but with only two submarginal cells in the anterior wings; second submarginal broad, much contracted apically, receiving the first recurrent nervure some distance from its base, and the second at its apex; lower section of basal nervure very much longer than upper, practically straight, except at the lower (basal) end, where it is bent

to meet the transversomedial, the latter being oblique, with its lower end more apical; stigma large; marginal cell ending very obtusely, not in a point on costa, but not truncate; venation of hind wings perfectly normal for the *Andrena* series; transversomedial nervure moderately oblique.

***Pelandrena reducta* sp. nov.**

♀. Robust, of ordinary form; length about 7 mm., anterior wing about 4 mm.; head and thorax black or nearly; abdomen and legs reddish brown; wings hyaline, becoming dusky on apical half; nervures and stigma rather light reddish brown; antennæ ordinary, flagellum 170 u. thick; hind legs with a copious and dense scopa. The following measurements of the anterior wing are in micromillimeters.

Depth of stigma 221; length of basal nervure on first discoidal (not allowing for curve) 595; length of marginal cell 1190, its breadth (depth) 340; length of first submarginal (from lower basal to upper apical corners) 714; second submarginal on marginal 357, on first discoidal 153, on third discoidal (not allowing for gentle outward curve) 442, and its outer side 187; first discoidal on third 442. Second recurrent nervure strongly bowed outward, but without any double curve.

*Hab.*—Miocene shales of Florissant, Colorado, Station 4 (*W. P. Cockerell*.) In my table of Florissant bees (*Bull.-Mus. Comp. Zool.*, 1906) this runs to *Libellulapis*, but differs entirely in the shape of the second submarginal cell.

***Halictus miocenicus* sp. nov.**

♀. Length 7 mm.; anterior wing about  $4\frac{1}{2}$ ; width of abdomen about 2.3-5 mm.; head and thorax black; abdomen and legs ferruginous; wings hyaline, slightly reddish, nervures and stigma pale ferruginous; antennæ normal, the flagellum about 2.1-5 mm. long. Head with very dense rather large punctures, so as to have a finely cancellate appearance; eyes prominent, apparently shallowly but broadly emarginate on inner side; metathorax finely granular, the sculpture finer than that of head; hind tibia and tarsi; with a very copious scopa. Venation normal for *Halictus*; second submarginal cell very narrow, receiving the first recurrent nervure near its end; third transverso-cubital without any double curve. third submarginal cell receiving second recurrent nervure somewhat beyond the beginning of its last third; stigma large; marginal cell ending in a point on costa; lower section of basal nervure very strongly curved. Venation of hind wings perfectly normal for *Halictus*.

The following measurements of the anterior wing are in micromillimeters; depth of stigma, 238; length of marginal cell 1377, its depth

357; lower section of basal nervure (not allowing for curve) 595; basal nervure apicad of transverso-medial 51; basal side of first submarginal cell 187, its lower side 731, its diameter measured from lower basal to upper apical corners 816; transverse (radial) diameter of second submarginal cell 187, its side on first discoidal 170; lower side of third submarginal 425; insertion of first to insertion of second recurrent nervures 374.

*Hab.*—Miocene shales of Florissant, 1908. In my table of Florissant bees (Bull-Mus. Comp. Zool. 1906) this runs to *Halictus florissantellus*, from which it differs by the broader, reddish abdomen; the light reddish nervures and stigma; the transversomedial separated from the basal nervure by a short interval, etc.

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## Two New Species of Coccinellidae (Coleoptera).

BY F. W. NUNENMACHER, Piedmont, Calif.

While working over some material collected near Goldfield, Nev., during the last year, I found two Coccinellidæ which I consider belong to undescribed species. I therefore take this opportunity to make them known.

### ***Coccinella vandykei* n. sp.**

Oval, strongly convex. Head, black, finely punctate, with two yellow spots on vertex. Thorax, black, shining, a little more coarsely punctured than the head, and with a quadrate yellow spot at each anterior angle. Elytra, bright red, finely but thickly punctured, and together marked with seven black spots. These latter are arranged as follows: A common large scutellar spot, and on each elytron, a small median one near the margin, a larger discoidal close to the suture, and a third large spot, more oblong than round or oval, placed subapically and closer to the margin than the suture. Under side black, the mesosternal epimeron and the metasternal epimeron yellow, moderately coarsely punctured throughout. L. .18 to .20 inch; w. .14 to .16.

Scarce, on sage brush at 6600 feet elevation Goldfield, Nev., VI, 29, '07.

I consider this species a form intermediate between *C. 9-notata* and *C. californica*, resembling the first most with regard to the elytral markings, and the latter most with regard to the markings of the head and thorax. The scutellar spot, with regard to its size and form, also more closely resembles that on *C. californica* than that on *C. 9-notata*.

With careful collecting in the northern parts of Nevada, I believe that forms might be discovered with characters so intermediate that we would be compelled to reduce this species to a variety of *C. g-notata*. So far no connecting links have been discovered.

***Brachyacantha blaisdelli* n. sp.**

Oblong, not very convex. Head, yellow in the ♂, black in the ♀ and with a large yellow spot placed vertically, shining, finely but thickly punctured with very shallow punctures. Thorax of ♂, black, slightly more heavily punctured than the head, a broad yellow patch laterally, and with front and side margins lined with a narrow pale or whitish yellow band. Thorax of ♀, black, punctured as in the male, with a broad yellow patch laterally but with light marginal band only found on the side margins and ending abruptly at the front angles. Elytra, black, shining, the punctures the same as on the thorax. Each elytron with a fascia and a sub-apical spot. The fascia is placed in front of the middle, is narrowest at its outer part where it touches the margin, but on the inner edge, is dilated into an irregular rounded blotch which does not quite reach the suture and which gives off a spur that runs parallel with the suture until it joins the sub-apical spot thus forming a sort of vitta. The confluence of the spur with the sub-apical spot is found in the ♀ but not in the ♂. Under side of thorax yellow; not strongly punctured; of body, black; femur, dark; knees, tibia, and tarsi testaceous. L. .18 to .20 in inch; w. .12 to .15.

Description based upon ♂ and ♀ taken at Goldfield, Nev., VI, 29, '07, by the author. Have also several other specimens from same locality and have seen several specimens taken by Dr. F. E. Blaisdell, at Mesa Grande, Sonoma Co., Calif., and one taken by Mr. F. C. Clark at Napa, Calif.

This species is closely related to *B. dentipes* Fab, but can be readily separated from it by the following characters: the form more narrow and less convex, by *B. dentipes*, having the markings of the front and sides of the thorax of the same color, orange, while *B. blaisdelli* has them of a different color, and with the front margin narrower. The tubercles in *B. blaisdelli* are more prominent and with a greater space between them: the fourth, fifth and sixth ventral segments are depressed, and the spine of the anterior tibia is not so strongly developed as it is in *B. dentipes*.

## Several New Western Jassids.

BY E. D. BALL, Logan, Utah.

### **Platymetopius nigriviridis** n. sp.

Form of *loricatus* nearly, with vertex longer in the female. Green with black markings. Elytra grayish white. Length ♀ 4.25 mm., ♂ 3.5mm.

Vertex very long and acute in the female, resembling *lautus*, twice as long as the pronotum. Pronotum short, very strongly, produced between the eyes. Elytra long and slender, appressed behind; venation slightly obscure, the central anteapical cell strongly constricted behind the middle. Front very narrow and tumid, almost triquetrus above, convex below, clypeus almost circularly expanded at the base.

*Color*—Vertex bright green wavily lined with black, omitting a median line on the anterior half and a pair of slightly divergent lines midway between the median line and the eyes, pale green. Pronotum green anteriorly shading out to dirty grayish white on scutellum, disc with three narrow pale stripes bordered with brownish fuscous. A broad brownish fuscous stripe behind either eye continuing along the outer margin of clavus, becoming attenuate posteriorly and often paralleled by a brownish line on disc. Veins of corium except the outer fork of the first sector irrorate or margined with brown, a black spot on the apices of the first and third apical and the first four costal veinlets. The brown markings sometimes absent from the basal half of corium. Face green, upper half of front slightly lined with black, lower half yellowish.

*Genitalia*—Female segment short almost truncate, median half slightly roundly produced behind; male, valve long, posterior margin semicircular, plates narrow triangular, exceeding the valve by about its length.

Described from four species from Tia Juana, California, collected by the author.

### **Platymetopius nigriviridis** var. *dixianus* n. var.

Form of *nigriviridis* nearly, slightly smaller and with a slightly shorter, broader vertex. Color creamy buff with a trace of greenish on tip of vertex. Vertex with the dark markings of *nigriviridis*. Slight traces of the markings of *nigriviridis* on the pronotum and apical cells of elytra.

Described from four females from St. George, Utah, collected by the author. This pretty little form from Utah's



"Dixie" was at first thought to be distinct from the California species, but what appears to be an intermediate form was taken at Colfax, California.

**Platymetopius majestus** n. sp.

Form of *elegans* nearly, but with a longer vertex in the male. Tawny and chestnut brown, iridescent. Length ♂ 4 mm.

Vertex, very long in the male over half longer than the pronotum, disc broad and flat the margins rounding to the rather blunt apex. Elytra moderately long and inclined to be flaring posteriorly. Venation obscure on the disc, the central anteapical cell slightly oblique and decidedly constricted behind the middle, outer anteapical cell oval, pointed in front. Front narrow slightly transversely convex, profile of upper half of face concave owing to the greatly lengthened vertex. Male, valve short broadly semicircularly rounding; plates short spoon-shaped, upturned.

*Color*—Vertex yellowish buff, the median suture narrowly lined with white. Pronotum brown or ashy gray. Scutellum brown with orange shadings in the angles. Elytra subhyaline washed with iridescent smoky brown omitting the sutural margin, the costal margin behind the middle and a transverse band before the apex. In one specimen the inner part of corium on the basal half, the apical band and about five reflexed veinlets are smoky black. Face and below shining black a line under the vertex margin, a broader one below it, the hind femora, and the plates white.

Described from two males from Pasadena, California, collected by the author. This is a striking species with its iridescent elytra and black face. The female will undoubtedly have an extremely long vertex.

**Platymetopius frontalis** var. *dorsalis* n. var.

Size and form of *frontalis*, pale fulvous washed with tawny brown. Length, 4mm.

Vertex with the margins slightly rounding, creamy yellow. Pronotum and elytra fulvous shading to tawny brown just inside the costal margins of elytra and extending forward onto pronotum. Lateral margins of pronotum, the scutellum, base of costa and sometimes a spot on clavus pale yellow. Face and below pale yellow.

Described from two specimens from Onaga, Kansas.

There are few good structural characters available in this genus and much use has been made of color and markings in defining species. This distinct variety of which several other

specimens have been seen was at first considered as a distinct species, but it possesses the same genitalia and the characteristic venation of *frontalis* and may well be an extreme color variation of that species.

***Platymetopius scriptus* n. sp.**

Resembling *frontalis*, but with a dark face and shorter vertex. Length ♂ 3.5 mm.

Vertex intermediate in form between *frontalis* and *brevis* about one-third longer on middle than against the eye, scarcely longer than the pronotum, disc slightly convex, the margin not produced. Face short straight, elytra broad, moderately short, the anteapical cells broad and parallel margined. Male valve long, broad, roundly pointed, plates triangular, roundly narrowing and then slightly produced at apex.

*Color*—Vertex brown with a line at the apex, an oblique dash on either side, a pair of irregularly quadrate spots on the anterior disc and another pair at the base tawny white. The quadrate spots often separated by a pair of light lines. Pronotum irregularly maculate with dark brown, traces of five light stripes. Scutellum, orange and brown. Elytra heavily irrorate with smoky brown, the costa lighter, usually the black nervures are very narrowly light margined and there are a number of ivory white dots in the ends of the cells, especially towards the apex. Face heavily irrorate with dark brown, the vertex margin narrowly light, as is also a short oblique crescent on the front just beneath the apex.

Described from five specimens, all males, from Onaga, Kansas. Readily separated from *frontalis* by the dark face and from *fuscifrons* by the shorter, stouter build and the parallel anteapicals.

***Platymetopius abruptus* n. sp.**

Resembling *frontalis*, but larger, broader, and with a dark face. Length 4.25 mm.

Vertex broad, nearly right angled, broader and shorter than in *frontalis*, a third longer than the pronotum in the female, slightly longer than the pronotum in the male, elytra broad, venation regular, the anteapical cells parallel margined, about ten reflexed veinlets to costa. Face strongly sloping; profile straight.

*Color*—Male heavily irrorate and reticulate with dark smoky brown above, leaving but a few small dots and reticulations of the pale ground color visible. An ivory line on apical third of vertex and a narrower one along margin. Elytra with the usual ivory white dots in the ends of the cells. Face and below heavily irrorate with dark smoky brown. The

female is much paler throughout, the pale ground color predominating over the brown reticulations. The basal half of vertex, especially against the eyes, and the base of scutellum are washed with dirty orange. The face is heavily and evenly irrorate with brown.

*Genitalia*—Female segment very broad and short, the lateral angles distinctly, roundly produced, posterior margin between the angles truncate with a broad shallow median notch which is heavily black bordered; male valve large broadly roundly pointed, plates broad abruptly rounding, only appearing as a narrow margin under the valve. Entire genitalia black.

Described for a single pair from Arizona. The female is much lighter than the male, but the structural characters are the same.

**Scaphoideus bicolor** n. sp.

Form and size of *fumidus* nearly, brown with the head and a broad stripe on the costa, lemon yellow. Length 4.75 mm.

Vertex, broad flat, right angled in front, slightly shorter than in *blandus*. Elytra long and narrow venation as in *blandus*, obscured by the color. Face sloping, slightly convex in profile, front very broad above rapidly narrowing to the almost parallel margined clypeus.

*Color*—Vertex lemon yellow, a faint black line on the anterior margin. The disc often washed with pale brown, omitting a median white line. Pronotum heavily irrorate with brown omitting a narrow anterior margin and the broad lateral margins behind the eyes. Scutellum castaneous with a broad median yellowish stripe. Elytra rich brown except for a broad lemon yellow costal stripe extending to the apical cells and a few pale spots in the cells. Face and below lemon yellow, legs and ovipositor infusate.

*Genitalia*—Female segment rather long, nearly truncate posteriorly, the median half slightly rounding with a median notch either side of which appears a faint rounding projection; male, valve small triangular, plates broad at base roundly narrowing and then attenuately produced.

Described from six specimens from Tia Juana, California, collected by the author.

**Neocoelidia candida** n. sp.

Resembling *lactipennis*, but longer and with a much broader head. Length 4.25 mm.

Vertex as broad as its median length, bluntly oval in front scarcely conically pointed, disc convex, rounding to the front without trace of a margin except at apex. Front tumid as in *lactipennis*, pronotum much more excavated behind than in *lactipennis*, anterior and posterior

margin parallel, lateral angles broadly rounding. Elytra broad and short, venation distinct, the outer fork of first sector usually forking to form a closed anteapical cell.

*Color*—Pale greenish white, vertex and front pale dirty straw color a black spot at apex, and sometimes a pair of quadrangular brown spots on disc. Two black points on scutellum, sometimes wanting, elytra powdered or milky white, sometimes greenish white, the nervures pale brown. Sometimes the apical cells are clouded with brown and the nervures between them are then broadly light.

*Genitalia*—Female segment long and narrow curved around the ovipositor, truncate posteriorly, the median half slightly angularly produced; male, valve broad at base, a little longer than its basal width apex acute, two round black spots on the disc.

Described from eight examples from the southern parts of Utah and Colorado.

***Neocoelidia reticulata* n. sp.**

Resembling *candida* in form, smaller. Green with reticulate veined elytra. Length scarcely 4mm.

Vertex broad, slightly longer than wide, bluntly conical the disc inclined to be flat but scarcely separated from front. Elytra moderately long, slightly exceeding the abdomen, venation coarsely and irregularly reticulate. Female segment moderately long, the posterior margin broadly evenly rounding.

*Color*—Vertex and front pale green a black spot on apex, pronotum pale green, an oblique milky dash on either side the anterior disc. Scutellum pale green the median line milky, expanding just before the apex into a triangular spot, a pair of black points on the lateral margin. Elytra milky or greenish white, pruinose, the reticulate venation dirty greenish brown.

Described from three females from Tia Juana, California, collected by the author. Readily separated from all other species by the reticulate venation.

***Neocoelidia compta* n. sp.**

Form of *candida* nearly, narrower with slightly longer elytra. Creamy white with three pairs of dark spots. Length 4.75 mm.

Vertex a trifle longer than its basal width, disc convex, apex distinctly conically pointed, vertex margin distinct from the eyes to apex. Pronotum rather long, parallel margined. Elytra moderately long, base of apical cells equalling the apex of ovipositor; venation obscure. Female segment very long, truncate or slightly emarginate posteriorly.

*Color*—Rich creamy white, a point on apex of vertex and a pair of

larger ones on scutellum shining black. A triangular mark just inside the middle of the claval area and an oblique one just before the apex of clavus extending out to inner sector of corium, dark brown. These two marks connected by a faintly outlined brown line which no doubt in darker specimens would represent the margin of a dorsal stripe.

Described from a single female from Mesilla, New Mexico (Cockerell).

***Neocoelidia pulohella* n. sp.**

Resembling *barratti*, but with a narrower and less ornamented stripe. Elongated, pale green with a definite dorsal stripe. Length ♀, 6.25 mm.; ♂, 5.5 mm.

Vertex a trifle longer than its basal width, disc convex, apex distinctly pointed. Pronotum long, deeply and almost angularly excavated posteriorly. Elytra long and narrow, the apex of clavus equalling the apex of ovipositor, costal margin convex its entire length. Female segment long, truncate or slightly emarginate, male valve long, roundly narrowing and acutely pointed.

*Color*—Pale greenish white, a broad median brown stripe extends from the black point on apex of vertex to the apex of clavus and a smoky brown stripe continues to apex of elytra. The brown stripe is margined with black from the base of the vertex back and varies in width as follows: Four regular oval enlargements on vertex, from which it regularly broadens to the base of the scutellum, then slightly narrows to the elytra, on the elytra there are three slightly angular enlargements increasing in size posteriorly. There is an irregular black spot just outside the apex of clavus on either side from which the smoky stripe takes its origin.

Described from five examples from Tia Juana, California, collected by the author. This species is much nearer to *lineata* than any other northern form.

***Neocoelidia tripunctata* n. sp.**

Longer than *compta*, resembling *pallida*, but broader. Pale with three black spots and a median brown stripe. Length 5.25 mm.

Vertex slightly longer than wide, very bluntly conical with a trace of a carinate margin near the apex, front very broad and tumid. Elytra rather long, broad and flaring at base then narrowing to the appressed apex, giving the insect an oval appearance. Female segment moderately long, posterior margin roundly truncate.

*Color*—Vertex and face creamy yellow, a large black spot on apex. Pronotum pale straw, a pair of faint brown stripes broadly margined exteriorly with milky white, scutellum milky, with a pair of shining black points. Elytra with a narrow common sutural stripe of rich brown margined either side with a broader stripe of milky white which shades out into the subhyaline white of the elytra.

Described from a single female from Arizona. A pale, but very pretty and distinct species.

## A Partial List of the Lepidoptera of Pickaway County, Ohio.

BY B. R. BALES, M.D.

The following list of the Lepidoptera of Pickaway County, Ohio, consists only of specimens actually taken within a radius of five miles of Circleville, the county seat, in 1907 and 1908, at odd times and spare moments in the active life of a general practitioner of medicine.

Being the list of the specimens taken in only two years, it must necessarily be incomplete, but I hope to supplement it with a further list of new specimens taken in 1909 and 1910.

Those species that I have classed as "common" or "rare," are only common or rare as I have found them in 1907 and 1908.

The collecting ground lies in the level, fertile valley of the Scioto River, and is mainly under cultivation, with an occasional tract of woodland. There are a number of small streams of varying size, near which are favorite places for both moths and butterflies. Pickaway County lies a little south of the center of Ohio.

The arrangement and sequence used by Dr. W. J. Holland in his Moth and Butterfly Books is followed, as far as possible, throughout the list.

I wish to acknowledge my indebtedness to Mr. Frank Haimbach, of Philadelphia, and Prof. Jas. S. Hine, of the Ohio State University, for kindly assistance in the identification of doubtful specimens.

### RHOPALOCERA.

*Anosia plexippus* (Linn). Very common. An immense migrating army of this species passed through Circleville on October 4th, 1907. A record of this can be found in ENTOMOLOGICAL NEWS, Vol. XVIII, No. 9, p. 402.

*Argynnis cybele* (Fab.). Common in the hay fields and meadows.

*Argynnis idalia* (Drury). Not common. Several taken.

*Phyciodes nysteis* (Doubleday & Hewitson). Not common.

*Phyciodes batesi* (Reakirt). Common along the small water courses.

*Grapta interrogationis* (Fab.) form *fabrici* (Edw.). Common.

*Grapta interrogationis* (Fab.) form *umbrose* (Lint.). Common.

*Grapta comma* (Harris), form *dryas* (Edw.). Not as common as the preceding species.

*Grapta comma* (Harris), form *harrisi* (Edw.). Same as the preceding.

*Vanessa antiopa* (Linn.). Common.

*Pyrameis antiopa* (Linn.). Common.

*Pyrameis cardui* (Linn.). Not as common as the preceding.

*Pyrameis huntera* (Fab.). Not common.

*Junonia coenia* (Hubn.). Not common. Several taken.

*Basilarchia astyanax* (Fab.). Common.

*Basilarchia disippus* (God.). Common in company with *A. plexippus* among the milk-weed blossoms.

*Chlorippe celtis* (Boisd. & Lec.). Common; mainly seen in open woods.

*Chlorippe clyton* (Boisd. & Lec.). One specimen taken.

*Debis portlandia* (Fab.). Fairly common in woodlands.

*Neonympha eurytus* (Fab.). Common in woods.

*Satyrodes canthus* (Boisd. & Lec.). Common in the tall grass of swampy meadows and near small streams and ditches.

*Feniseca tarquinius* (Fab.). Uncommon.

*Chrysophanus thoe* (Boisd.). Common in the tall grasses of waste fields and marshy places.

*Lycaena pseudargiolus* (Boisd. & Lec.). Fairly common.

*Lycaena pseudargiolus* (Boisd. & Lec.) form *violacea* (Edw.). Several taken.

*Lycaena pseudargiolus* (Boisd. & Lec.), form *neglecta* (Edw.). Several taken.

*Lycaena comyntas* (God.). Common at road sides, ditches and mud puddles.

*Euchloe genuita* (Fab.) Uncommon; two ♂♂ taken on April 26, 1908.

*Pieris rapae* (Linn.). The commonest butterfly.

*Pieris protodice* (Boisd. & Lec.). Common; does not appear as early in the spring as *P. rapae*.

*Colias eurytheme* (Boisd.). Several albinic ♀♀ taken.

*Colias eurytheme* (Boisd.), form *keewaydin* (Edw.). Fairly common; several taken.

*Colias philodice* (God.). Common.

*Papilio ajax* (Linn.), form *walshi* (Edw.). Fairly common in early spring.

*Papilio ajax* (Linn.), form *telamonides* (Felder). Not as common as the preceding.

*Papilio ajax* (Linn.), form *marcellus* (Boisd.). Common.

*Papilio turnus* (Linn.). Common. One taken that very closely approaches the description of *P. rutulus*.

*Papilio turnus*, form *glaucus* (Linn.). Not common.

*Papilio cressphontes* (Cramer). Common. Three full grown larvæ were brought to me on October 8, 1907. The following day, I drove out into the country to where they had been taken, and found that they had been feeding on the leaves of a small prickly ash bush in the dooryard of a farm house. The bush was almost denuded of foliage. The farmer told me that on the preceding Sunday, when he first discovered them, that he had killed "about a hundred." I found several that he had not killed and brought them away with me, with the few remaining prickly ash leaves. The leaves were soon gone, and I succeeded in raising the larvæ to maturity on the leaves of a potted orange tree. The chrysalids and imagoes of those raised to maturity on orange leaves were not as large as those raised on a steady diet of prickly ash leaves.

*Papilio asterias* (Fab.). The commonest *Papilio*.

*Papilio troilus* (Linn.). Common.

*Papilio philenor* (Linn.): Fairly common.

*Epargyreus tityrus* (Fab.). Common; the larvæ are abundant on *Wisteria* and common locust.

*Thorybes pylades* (Scud.). Two specimens taken in woods.

*Thorybes bathyllus* (Smith & Abbot). Common among the red clover blossoms.

*Hesperia montivaga* (Reak). Large quantities of string beans are raised near Circleville for the canning factories. This species was found to be common in the bean fields where the ♀♀ may have been ovipositing. Roadside mud puddles are favorite places for this species.

*Pholisora catullus* (Fab.). Common at mud puddles in roads.

*Thanoas brizo* (Boisd. & Lec.). Took two ♂♂ and a ♀ April 26, 1908. They were feeding in company with the following species at the blossoms of spring beauties (*Claytonia virginica*) and spreading phlox (*Phlox carolina*).

*Thanoas juvenalis* (Fab.). Several taken.

*Thanoas perseus* (Scud.). Not common.

*Amblyscirtes vialis* (Edw.). One specimen taken in 1907.

*Ancyloxypha numitor* (Fab.). Very common along the grassy banks of ditches.

*Polites peckius* (Kirby). Common in the clover fields.

*Limochares pontiac* (Edw.). One ♀ taken.

*Limochares taumus* (Fab.). Common in fields and weedy places. They seem to be especially common about jewel weeds near streams.

*Atrytone zabulon* (Boisd. & Lec.). Common about blackberry blossoms in woods in the springtime.



*Atrytone zabulon*, Boisd. & Lec., form *pocahontas*, Scud. One specimen taken.

### HETEROCERA.

*Protoparce sexta* (Johanssen). Very common at stramonium blossoms at twilight and at light at night.

*Protoparce quinquemaculatus* (Haworth). Not common.

*Hyloicus chersis* (Hubn.). Not common.

*Sphinx jamaicensis* form *geminatus* (Say). Fairly common.

*Pachysphinx modesta* (Har.). Not common.

*Cressonia juglandis* (Ab. & Sm.). Not common.

*Errinyis ello* (Linn.). A perfect ♀ was found on the ground, stupefied with cold, on October 5, 1907.

*Haemorrhagia thysbe* (Fab.). Not uncommon.

*Haemorrhagia thysbe* (Fab.) form *cimbiciformis* (Steph.). Not uncommon.

*Pholus pandorus* (Hub.). Not uncommon.

*Darapsa myron* (Cramer). Several taken at light.

*Samia ceropia* (Linn.). Very common. On May 17, 1907, while wading a swamp for birds' eggs, I saw at least one hundred and fifty cocoons of this species and several moths just out of the cocoon, on the buttonwood bushes with which the swamp is overgrown. The swamp is about one-fourth mile across and the water is from one to three feet deep, and is the nesting place of a large colony of red-winged blackbirds. King rails, Florida gallinules, least bitterns and other aquatic birds nest in this swamp, and the fact that there were so many cocoons would indicate that the larvæ are evidently not attacked much by this class of birds.

*Calosamia promethia* (Drury). Not common.

*Actias luna* (Linn.). Not uncommon.

*Telea polyphemus* (Cramer). Common.

*Automeris io* (Fab.). Common.

*Anisota rubicunda* (Fab.). Not common. Several taken.

*Adelocephala bicolor* (Harris). Several taken.

*Syssphinx bisecta* (Lint.). Not uncommon at light.

*Citheronia regalis* (Fab.). Fairly abundant.

*Basilonia imperialis* (Drury). Common.

*Scopsis fulvicollis* (Hubn.). Not uncommon.

*Hypoprepia miniata* (Kirby). One specimen taken at light.

*Hypoprepia fucosa* (Hubn.). Common at light.

*Holomelina opella* (Grote). One specimen taken in woods.

*Holomelina immaculata* (Reak). Common in waste fields and at light.

*Holomelina aurantiaca* var. *ferruginosa* (Walk.). One specimen taken among the grasses in a pasture field.

- Utetheisa bella* (Linn.). Not uncommon.  
*Haploa chymene* (Brown). Not common.  
*Haploa lecontei* (Boisd.), form *dyari* (Merrick). Not uncommon.  
*Haploa lecontei* (Boisd.), form *militaris* (Harris). Common in June in woods that are overgrown with underbrush.  
*Haploa lecontei* (Boisd.), form *vestalis* (Packard). Not uncommon.  
*Estigmene acraea* (Drury). Common.  
*Estigmene congrua* (Walk.). One specimen taken in woods, May 31, 1908.  
*Hyphantria cunea* (Drury). Not uncommon at light.  
*Hyphantria cunea* (Drury) var. *punctatissima* (Ab. & Sm.). One specimen taken.  
*Isia isabella* (Ab. & Sm.). Very common.  
*Diacrisia virginica* (Fab.). Common.  
*Diacrisia latipennis* (Stretch). Not nearly as common as the preceding.  
*Apantesis vittata* (Fab.). Common at light.  
*Apantesis vittata* (Fab.), form *phalerata* (Harris). Not common; several specimens taken.  
*Apantesis arge* (Drury). Uncommon. One specimen taken.  
*Parteuchaetias tenera* (Hubn.). Common at light.  
*Euchaetias egle* (Drury). Not uncommon.  
*Halisidota tessellaris* (Ab. & Sm.). Fairly abundant.  
*Halisidota caryae* (Harris). Several specimens taken.  
*Alypia octomaculata* (Fab.). Not common. Two specimens taken.  
*Apatela americana* (Harris). Not common.  
*Apatela lepusculina* (Guenee). One specimen taken.  
*Apatela lobeliae* (Guenee). One specimen taken.  
*Apatela albarufa* (Grote). Two specimens taken.  
*Apatela brumosa* (Guenee). One specimen taken.  
*Apatela obliterata* (Ab. & Sm.) Common.  
*Perigea xanthioides* (Guenee). Not uncommon at bait in late summer.  
*Perigea vecors* (Guenee). Not common.  
*Hadena modica* (Guenee). Taken at bait in late summer.  
*Hadena dubitans* (Walker). Not uncommon at bait in late summer and early fall.  
*Hadena devastatrix* (Brace). One of the earliest moths. A specimen was taken at arc light on March 27, 1908.  
*Euplexia lucipara* (Linn.). Not uncommon at bait in late summer.  
*Pyrophila pyramidoides* (Guenee). Common at bait.  
*Prodenia ornithogalli* (Guenee). Common at bait.  
*Agrotis ypsalon* (Rottemberg). Common.

- Peridroma saucia* (Hubn.). Common.  
*Noctua bicarnea* (Guenee). Common at bait.  
*Noctua c-nigrum* (Linn.). Common.  
*Feltia subgothica* (Haworth). Common at bait.  
*Feltia herilis* (Grote). Not as common as the preceding.  
*Mamestra renigera* (Stephens). Common.  
*Heliophila unipuncta* (Haworth). Common at light and at bait, where it proves itself a nuisance by often preventing the capture of rarer specimens.  
*Heliophila multilinea* (Walker). Not uncommon at bait.  
*Heliophila pseudargyrea* (Guenee). Not common.  
*Xylina unimoda* (Lint.). One taken at arc light, March 27, 1908.  
*Cuculia asteroides* (Guenee). Fairly abundant.  
*Papaipema nitela* (Guenee). Not uncommon.  
*Papaipema nitela* var. *nebris* (Guenee). Not uncommon.  
*Pyrrhia umbra* (Hufnagel). Not common at bait in late summer.  
*Eucirroedia pampina* (Guenee). Several seen and taken on October 4, 1908, among hazel bushes in a rather open woods.  
*Scoliopteryx libatrix* (Linn.). Not common. Several taken at bait in late summer.  
*Orthosia helva* (Grote). Not uncommon at bait in late summer.  
*Orthosia aurantiago* (Guenee). Rare. One taken at bait in late summer.  
*Rhodophora gaurae* (Ab. & Sm.). Not uncommon at light.  
*Schinia thoreau* (Grt. & Rob.). One specimen taken at light.  
*Schinia marginata* (Haworth). Common at light.  
*Euthisanotia unio* (Hubn.). Very common in swampy meadows.  
*Euthisanotia grata* (Fab.). A crushed specimen found under an arc light.  
*Cyrtophanus triangulifer* (Grote). One specimen taken.  
*Plagiomimicus pityochromus* (Grote). Not uncommon.  
*Autographa bimaculata* (Stephens). Not uncommon.  
*Autographa simplex* (Guenee). Common.  
*Ogdoconta cinerola* (Guenee). Not uncommon at bait.  
*Rivula proprinquialis* (Guenee). One specimen taken.  
*Eustroita muscosula* (Guenee). Not uncommon.  
*Eustroita carneola* (Guenee). Common.  
*Galgula hepara* (Guenee). Common at bait in late summer.  
*Galgula hepara* var. *partita* (Guenee). Common at bait.  
*Chamrys cerintha* (Treitschke). Rather abundant.  
*Tarache aprica* (Hubn.). One specimen taken.  
*Homopyralis contracta* (Walker). Several specimens taken.  
*Drasteria crassiuscula* (Haworth). Very common.  
*Catocala vidua* (Guenee). Not uncommon.

- Catocala resecta* (Grote). Not uncommon.  
*Catocala robinsoni* (Grote). Not uncommon.  
*Catocala cara* (Guenee). Very common.  
*Catocala amatrix* (Hubn.). Common.  
*Catocala amatrix* (Hubn.), form *nurus* (Walker). Common.  
*Catocala innubens* (Guenee). One specimen taken.  
*Catocala innubens* (Guenee), form *hinda* (French). One specimen taken.  
*Catocala piatrix* (Grote). Common.  
*Catocala habilis*, form *basilis* (Grote). One specimen taken.  
*Phoberia atomeris* (Hubn.). More often seen early in the spring, in woods.  
*Parallelia bistriaris* (Hubn.). Common at bait in late summer and at light earlier in the season.  
*Homoptera lunata* (Drury). Common at bait.  
*Homoptera lunata*, form *edusa* (Drury). Common at bait, though not so plentiful as the preceding.  
*Epizeuxis americana* (Guenee). Not uncommon.  
*Epizeuxis lubricalis* (Geyer). Not uncommon.  
*Philometra eumelusalis* (Walk.). Common.  
*Chytolita morbidalis* (Guenee). Several taken.  
*Renia discoloralis* (Guenee). Several taken.  
*Heterogramma pyramusalis* (Walk.). Not uncommon.  
*Palthis angulalis* (Hubn.). Fairly abundant.  
*Bomolocha baltimoralis* (Guenee). Fairly common.  
*Bomolocha abalinealis* (Walk.). Common among the grasses of fields and lawns.  
*Plathypena scabra* (Fab.). Very common in grassy places.  
*Datana ministra* (Drury). Common.  
*Nerice bidentata* (Walk.). Not common.  
*Heterocampa umbrata* (Walk.). Not common. Several taken at light.  
*Leptomeris quinquelinearia* (Packard). Common. Specimens taken  
*Hemerocampa leucostigma* (Ab. & Sm.). Not common.  
*Tolype vedella* (Stoll). Seen in the fall. Not common.  
*Dyspteris abortivaria* (Herrich-Schaeffer). Common.  
*Eudule mendica* (Walk.). Common in woods.  
*Heterophleps triguttata* (Herrich-Schaeffer). Common in the same localities as the preceding species.  
*Euchoeca albobittata* (Guenee). Not common.  
*Eustroma diversilineata* (Hubn.). Not uncommon.  
*Mesoleuca lacustrata* (Guenee). More commonly seen in the woods in the spring before the leaves are out.  
*Haematopis grataria* (Fab.). Common.

- Erastria amaturia* (Hubn.). Not uncommon.
- Synelys alabastaria* (Hubn.). Not uncommon among the weeds and tall grasses at the edge of a swamp.
- Leptomeris quinquelinearia* (Packard). Common. Specimens taken in May, June and August.
- Spnchlora glaucaria* (Guenée). Not uncommon at light.
- Orthofidonia vestaliata*. Common in spring in dark moist woods.
- Mellilla inextricata* (Walk.). Common in woods in early spring.
- Mellilla chamaechrysaria* (Grote). Common in woods in early spring.
- Philobia enotata* (Guenée). Not common. Several taken in woods in May, 1908.
- Cleora pampinaria* (Guenée). Taken at bait and at light.
- Lycia cognataria* (Guenée). One specimen taken at light.
- Therina endropiaria* (Gte. & Rob.). One specimen taken at light.
- Ennomos magnarius* (Guenée). Common at light in the fall.
- Xanthotype crocataria* (Fab.). Common.
- Xanthotype crocataria* (Fab.), form *caelaria* (Hulst.) Not as common as the preceding.
- Plagadis emargataria* (Guenée). Not common.
- Hyperitis amicaria* (Herrich-Schaeffer). Common in woods from early April throughout the summer.
- Gonodontes hypochraria* (Herrich-Schaeffer). Not uncommon in the woods in June.
- Euchlaena johnsonaria* (Walk.). Two specimens taken.
- Euchlaena pectinaria* (Denis & Schiffenmuller). Not common. Taken in the deep woods in June.
- Caberodes confusaria* (Hubn.). Common at light and bait in late summer.
- Sabulodes lorata* (Grote). Not common. Several taken at light.
- Sabulodes transversata* (Drury). Came freely to a light in woods in late summer.
- Calledapteryx dryopterata* (Grote). Not uncommon.
- Nigetia formosalis* (Walk.). Not uncommon at bait.
- Thyridopteryx ephemeraeformis* (Haworth). Common.
- Cossus centerensis* (Lint.). A specimen, somewhat battered, was taken at light on May 26, 1908.
- Sannanoides exitiosa* (Say). Not uncommon about peach and apricot trees.
- Geshna primordialis* (Dyar). Plentiful in late summer, when it was found feeding at the blossoms of Boneset (*Eupatorium*).
- Desmia funeralis* (Hubn.). Common.
- Blepharomastix banalis* (Guenée). Common among the grasses in fields and lawns.

*Crocidophora serratissimalis* (Zeller). Common among the saw grasses at the edge of a swamp.

*Nomophila noctuella* (Denis & Schiffermuller). Common in hay fields and pastures. Comes freely to light.

*Pyrausta acrimonalis* (Walk.). One specimen taken.

*Pyrausta oxydalis* (Guenee). Not common. Several taken.

*Pyrausta generosa* (Grt. & Rob.). One specimen taken.

*Pyrausta unimaculata* (Grt. & Rob.). One specimen taken.

*Eustixia pupula* (Hubn.). Only one specimen of this beautiful little moth taken.

*Pyrallis farinalis* (Linn.). Common.

*Tosale oviplagalis* (Walk.). One specimen taken at bait.

*Crambus laqueatellus* (Clemens). Common.

*Crambus alboclavellus* (Zeller). One specimen taken.

*Crambus trisectus* (Walk.). Not common.

*Cenopsis groteana* (Fernald). One specimen taken in thick woods, May 31, 1908.

*Epagoge sulphureana* (Hubn.). One specimen taken.

*Archips parallela* (Robinson). One specimen taken.

*Archips argyrospila* (Walk.). One specimen taken.

*Tortrix palorana* (Robinson). One specimen taken.

*Tortrix albicomana* (Clemens). One specimen taken.

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NOTE ON FOOD HABIT OF *LIOTROPIS CONTAMINATUS* UHL.—Professor A. E. Vinson, of Tuscon, Arizona, has recently sent me a specimen of this pentatomid, and since the food habits of the species appear not to have been recorded heretofore, it seems worth while to put on record a statement received from him concerning the occurrence of the specimen. He says it was found Jan. 28, '09, "in a fruit cluster of *Opuntia fulgida* about six miles east of Tucson on the S. P. R. R." The occurrence of the specimen on this plant need not necessarily mean that this is the native food plant (the species even may be carnivorous), but considering the scant vegetation of the plains and the mode of occurrence it would seem quite probable that this plant is its regular habitat. The species has been collected only rarely. It was described by Professor Uhler in 1897 from specimens obtained in Arizona, and has since been mentioned but once or twice in literature. I have specimens in my collection collected by Mr. H. F. Wickham in El Paso, Texas, and Inyo Mts., Calif., the latter at elevation of 7,000 to 9,000 feet. Other members of the genus occur in the same region, and the widely distributed *L. numeralis* is a fairly common species throughout the eastern United States.—HERBERT OSBORN, Ohio State University, Feb. 2, 1909.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., APRIL, 1909.

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At its meeting in Baltimore last December the Entomological Society of America passed the following resolution: "That it is the sense of this Society that the duty on insects is objectionable and should be abolished." In accordance with this resolution a suitable memorial was prepared by Mr. W. C. Wood of New York and sent to the "Ways and Means" Committee of Congress. A duty on insects is an annoyance to entomologists and serves no useful purpose. There is no element of protection to American industries in it as few imported insects are also native of this country. As a source of revenue to the Government the amount collected is so trifling as to make the collection of a tariff not worth the trouble.

Moreover it is often impossible to properly assess values on such objects. The study of entomology should be encouraged in every way possible and even the collector is an important factor in the work as his collection will be consulted by the investigator and it is not unlikely sooner or later to find its way into some scientific institution.

The dealers do not desire a duty on insects; the entomologist does not, and it is too small a matter for the Government to bother about.

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THE centipede is a small creature, in spite of the fact that he is more than a six-footer.

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A SPECIES OF MOLE-CRICKET NEW TO THE UNITED STATES.—During the fall of 1906 a single mole-cricket was sent to me from Darien, Georgia. This specimen proves to be *Scapteriscus vicinus* Sc., and is of especial interest since it is the first record of this species being found in the United States. I learned that these insects had become very prevalent during that summer and that much injury had been done by them to the golf course at Darien.—M. HEBARD.

IN a note in the March number of ENT. NEWS, page 112, Mr. Karl R. Coolidge announces, that the generic name *Pronuba* Riley is preoccupied and he proposes the name *Valentinia* Coolidge to take its place. This name would be very excellent and appropriate except for the fact that it is itself preoccupied by *Valentinia* Walsingham (Proc. U. S. Nat. Mus., xxxiii, page 200, 1907). Moreover, it has long been known that *Pronuba* was preoccupied (cf. Walsingham Ent. Mo. Mag., 39, page 260, 1903), and the generic name *Tegeticula* Zeller (1873), given to the same species, takes the place of Riley's name. There is plenty of room in the synonymy, but does the mere possession of a copy of Scudder's Nomenclator justify anyone in adding to it by proposing names in groups of which he has no special knowledge.—AUGUST BUSCK.

JOHN B. KISSENGER, of South Bend, Indiana, who, in the interest of science, submitted to the bite of a yellow fever mosquito while in the army in Cuba, and for whose relief a bill has been introduced in Congress, is now, and has been for years, almost helpless.

Kissenger, who volunteered for the experiment, was bitten by mosquitoes carrying yellow fever germs and then treated by the best medical experts in the army. It was supposed he had recovered his health and that as a result of the experiment yellow fever could be guarded against, but he later suffered a breakdown and is now a physical wreck, unable to use his feet and legs. Two others died from inoculation, and in each case the Government has given the widows pensions of \$100 a month. Kissenger's friends say he is entitled to the same amount.—*The Record*.

COLEOPTERA COLLECTING BY GAS-LIGHT.—The excitement of night collecting can only be realized after one has partaken of it, descriptions fall far short of picturing the pleasure it brings or the knowledge gained by one interested in collecting insects.

During the past year Mr. H. B. Kirk, of Harrisburg, and myself have utilized many of our spare evenings and nights in this way, and it has added materially to our knowledge and collection. We start out at dusk



with our light, a gas-lamp borrowed from a bicycle; flashing it on trees and earth and many a nocturnal prowler has been taken that in daylight would have been snugly housed in some inaccessibly dark retreat. These excursions began in April and were carried on until the cool evenings made our trips useless.

Among the trips we made I will mention a few that yielded good results, although most of them brought to light many things new and interesting to us.

On the evening of April 24th while walking through a strip of woodland on the outskirts of the city we found a dog that had met an untimely end. It was alive with Diptera larvae and feeding on these were several species of Carabids and *Silpha surinamensis* Fab., the latter appeared to suck the juices from the larvae, it would take a larva in its jaws for a few moments, drop it and repeat the performance with another; we also took *S. inaequalis* Fab. and *S. surinamensis* Fab., a specimen of *Necrophorus*, Histerids, Dermestids, also *Staphylinus maculosus* Grav., *Creophilus villosus* Grav. and many other Staphylinids, all apparently feeding on the carrion.

On May 12th we found specimens of *Lachnosterna* feeding on a shrub along the park driveway in numbers so great, they resembled in the gas-light small cherry-trees laden with fruit.

June 13th we visited a grove of dead and dying hickory trees, our practice was to throw the light on the trunks of these trees, which revealed this time *Graphisurus fasciatus* DeG., whose modest coat and the fact that it remained motionless in the light made it hard to distinguish from the gray bark; we also took *Cyllene pictus* Dru. and *Neoclytus erythrocephalus* Fab. We found that in all our night collecting when the light was thrown on a tree-trunk, the insects on it would remain motionless until the light was removed, although a slight touch would cause them to drop, so we invariably used a cyanide jar for this latter purpose, touching the insect lightly with the rim of the jar, it would drop into it of its own accord.

On July 6th we visited the same grove of hickory, the night was warm and sultry and the first tree we turned our attention to was swarming with *Saperda discoidea* Fab., there they clung motionless in the cracks of the bark, probably ovipositing as they appeared to be mostly females; we took a quantity of these, the next tree yielded more *S. discoidea*, *Xylotrechus colonus* Fab. in quantity, running up and down like ants; *Neoclytus luscus* Fab. was fairly common and about one-half dozen specimens of *Distenia undata* Oliv. were taken, these trees were also infested with several species of Scolytids and two specimens of the Clerid, *Thaneroclerus sanguineus* Say. fell to our lot. Pulling the loose bark from a dead oak, *Smodicum cucujiforme* Say. was found in large numbers also several specimens of *Eupsalis minuta* Dru.

These insects were found every trip we made here until the eleventh, on this trip our hickory trees were over-run with *Clerus quadrisignatus* Say, we collected a number of them and one lively chap managed to get down between my collar and neck, I can testify that they can bite right smart.

*Parandra brunnea* Fab. was plentiful and a dying mulberry tree yielded *Elaphidion incertum* Newm. in quantities, we also found this species on hickory and oak.

July 19th we found a partially dead ash tree and secured a goodly number of *Tylonotus bimaculatus* Hald. that were running over the trunk, also *Neoclytus erythrocephalus* from the same tree.

On August 1st we visited an oak tree that in several places the bark had been injured, and from which sap was exuding, several species of Nitidulidae were enjoying themselves thereon, among them were *Ips obtusus* Say, *I. quadriguttatus* Fab. and *I. sanguinolentus* Oliv., a variety of other insects were also enjoying the feast; farther up on the trunk we spied several pairs of *Eburia quadrigeminata* Dru. which we added to our catch.

Many other insects were taken on these trips although the majority were Beetles, a great variety of Tenebrionidae, usually feeding on fungi, Carabids running along the paths in search of prey and several species of *Cymatodera* and other Clerids were halted on their journey by the glare of the light.

To a collector we would recommend this as a profitable means of increasing his collection and many interesting habits would be learned by one working out life histories.

We are indebted to Mr. W. S. Fisher, of Highspire, Pa., for the termination of most of the specimens mentioned in this paper.

ALFRED B. CHAMPLAIN, Harrisburg, Pa.

EVERES COMYNTAS—*amyntula*.—I am working up the distribution and specific identity of the genus *Everes*, but in coming to the American species *comyntas* and *amyntula* I find myself beset with difficulties from lack of material. The whole genus is subject to considerable variation, though within very narrow lines. Our European and Eastern species are subject to much variation, but the variations are quite small and within very restricted limits, yet they are perceptible, and in some cases have important specific bearing. In conjunction with Mr. Tutt and Dr. Chapman I have had to carefully tabulate our European and Eastern forms, and as far as possible the American species also. I notice that the variations of *comyntas* and *amyntula* are progressing very closely along similar lines, as has been the case with our *argiades* and *comyntas*, but they have not proceeded so far. The whole subject is one of considerable interest, especially when worked

out by the genitalia as I have been doing, but to clear up the American species I want a great deal of material, the variations are so small that the only safe way of coming to the correct conclusions is to obtain as large a series of each as possible, and especially in localities where the two overlap. Will American entomologists help me? I shall be glad of as large a series as possible, both from the Eastern and Western States, as also from the Central ones, I would only ask that correct localities be given, and as far as possible, dates, the latter being an important factor in the matter. I will do my best to make an adequate return, either in Palearctic butterflies or Exotic species, especially New Guinea and African.

Appeals like this often pass almost unheeded, but I trust this may not be so, and I shall be most grateful for any assistance that may be kindly given.—GEORGE T. BETHUNE-BAKER, 19 Clarendon Road, Edgbaston, England.

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## Doings of Societies.

A regular meeting of the Brooklyn Entomological Society was held at 55 Stuyvesant Avenue February 4, 1909, with President J. B. Smith, twenty-six members and seven visitors present.

W. Korte, 148 Dean Street, was elected an active member.

Dr. Raymond C. Osburn, of Barnard College, delivered a lecture on the life habits of the Odonata, illustrated by many lantern slides. He has observed about twenty species breeding equally well in fresh or brackish water. The limit is about one-third of the salinity of sea water. On adding salt the larvæ were observed to be greatly disturbed and soon died. The eggs of many species were shown and the embryology illustrated. The embryo turns completely around before the egg hatches. The method of copulation varies only as between the Zygoptera and Anisoptera. Larval characters and habits vary greatly among the different genera. The egg takes six days to three weeks to develop. Larval life from three months to three years. Pupation terrestrial. Respiration and transformation were fully considered.

E. L. Dickerson and John A. Grossbeck, of the New Jersey Agricultural Experiment Station, demonstrated their method of bleaching, staining and mounting lepidopterous wings for

study purposes. The wings are removed from the body and dipped in alcohol to soften them. A few minutes suffices. They are then dipped in Labaraque solution until thoroughly bleached. They are then transferred to alcohol to remove the solution. Next they are transferred to a solution of eosin, a crimson aniline dye. The time depends on the thickness of the wing. When a proper tint is obtained the wings are laid on microscopic slides with sufficient xylol balsam. A cover glass placed above them gives a permanent mount. Large wings thus mounted showed not only venation, but the circulatory tubes at junction point with body and the different muscles which carry on the flight.

Others explained that bleaching may be hastened by dipping into dilute hydrochloric acid before the Labaraque solution. Javelle water or a saturated solution of chloride of lime are substitutes for Labaraque solution.

R. P. Dow, *Recording Secretary*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held November 19, 1908. In the absence of the Director and the Vice-Director, Dr. D. M. Castle presided. Nine persons were present.

Mr. Matthews exhibited some brilliant moths and butterflies from India. Mr. Ilg exhibited specimens of Lepidoptera he had collected last summer in Germany.

Dr. Calvert exhibited the following Odonata: A pair of *Calopteryx apicalis* Burm. from the Great Egg Harbor River above Weymouth, New Jersey, taken August 8, 1905, remarkable for their size (abdomen ♂ 32, ♀ 30.5 mm., hind wing ♂ 23, ♀ 25 mm.); a female *Gomphus parvulus* Selys. from Mt. Pocono, Monroe County, Pennsylvania, June 13, 1906, by Mrs. Calvert; this species was recorded from Berks and York Counties by Hagen in 1875, but since that time has not been mentioned from the eastern part of Pennsylvania; *Enallagma geminatum* Kellicott ♀ from Philadelphia, and *E. traviatum* Selys. from Clementon, New Jersey, June 4, 1908.

Mr. Daecke said he had taken *Hetaerina american* at a num-

ber of localities in New Jersey, and they were smaller than Pennsylvania specimens.

Mr. Rehn exhibited specimens of three species of Orthoptera, one a walking-stick and two grasshoppers, which were found inhabiting the grease-wood, a creosote bush of the southwestern deserts. The speaker, with the aid of a map, showed the distribution of the plant, and stated that in addition to the species exhibited another rare grasshopper, *Clematodes larraea*, which has been taken only on this food plant. The same speaker exhibited several species of Orthoptera which frequented the rabbit-weed of portions of the desert plains.

Mr. Daecke said that on May 28th he had exhibited a living antlion larva and again brought it to the meeting this evening, as it was still alive and in good condition.

Dr. Skinner exhibited a series of *Argynnis platina* and *snyderi* captured at Provo, Utah, by Tom Spalding. The constant differences between the species were pointed out.

Dr. Castle said he had received some *Donacia* packed in cotton and they were infested by *Anthrenus*. He put them in the oven and forgot them and they remained twenty-eight hours. The color had changed to a bright metallic green.

Mr. F. J. Kelley was elected an associate.

HENRY SKINNER, *Recorder*.

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A meeting of the Entomological Section was held December 17, 1908. In the absence of the Director and Vice-Director, Dr. D. M. Castle presided. Twelve persons present.

Dr. Calvert said he had brought to him a ball five inches in diameter, composed largely of grain matted together. It was taken from the stomach of a calf. It had been infested by a species of grain moth and large numbers had been killed by bisulphide of carbon.

Mr. Weigand exhibited the *Cucullia* he had captured in Fairmount Park, Philadelphia which had been described as new by Professor Smith.

Mr. Haimbach said cattle collect a large amount of hair in their stomachs in licking off the eggs of the warble-fly.

The following were elected to serve as officers for 1909:

*Director*, Philip Laurent.

*Vice-Director*, H. W. Wenzel.

*Treasurer*, E. T. Cresson.

*Conservator*, Henry Skinner.

*Secretary*, E. T. Cresson, Jr.

*Publication Committee*, E. T. Cresson, E. T. Cresson, Jr.

HENRY SKINNER, *Recorder*.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held January 28, 1909, Mr. Philip Laurent, Director, presiding. Nine persons were present.

Dr. Henry Fox made a communication on observations made in northern Cape May County, New Jersey, to determine occurrence, abundance and distribution of species of *Cicindela* with reference to the physical features of the district. These features are grouped under four headings, as follows: Barren Beaches, Maritime Marshes, Interior Uplands and Cedar Swamps. In some cases these may be subdivided into minor areas, each characterized by its peculiar species of the genus. Ten species were collected in this area during the summer and early fall of 1908, as follows: *Dorsalis*, *lepida*, *hirticollis*, *repanda*, *punctulata*, *marginata*, *vulgaris*, *purpurea*, *modesta*, *generosa*. *C. dorsalis*, characteristic of the lower strand of the barrier beach, is exceedingly abundant in midsummer, scarcer in early fall. In September, 1907, it was much more abundant, owing probably to the lateness of the warm season of that year.

*C. lepida* rare. Occurs on dry sand of upper beach. *Hirticollis*, characteristic of the upper beach, where *Cakile edentula* forms a characteristic plant. *Repanda* rare in early summer, abundant in early fall. Found in interior uplands and on the sand dunes of barrier beaches. *Punctulata*, the common summer species of the interior uplands. Scarcer in early fall. *Marginata* is characteristic of the mud-flats of the maritime marshes. Some individuals were seen on the lower beach associated with *dorsalis*, but rare there.

*Vulgaris*, *purpurea*, *modesta*, were not seen during greater part of summer, but appeared in swarms in early September, when they frequent the sand roads of the pine barrens in the interior uplands. *C. generosa* appeared in early fall—only a few captured in early September.

Mr. George Greene said *marginata* had been found on the light sand at Avalon. C. Greene and Harbeck at same place had found *dorsalis* attracted to decayed meat.

Dr. Castle said he had seen *marginata* right on the beach at Tybee Island.

Dr. Calvert exhibited a pair of *Calopteryx apicalis* Burmeister, recently given to him by Provost Philip R. Uhler. They are labeled "Penn" (sylvania) and the male also bears the letter "H" and a number. Provost Uhler had told the speaker that the latter label indicates that the specimen had been taken at or near the residence of the late Professor Haldeman, Columbia, Lancaster County, Pennsylvania. This is the first record of this species in Pennsylvania known to the speaker other than Hagen's and his own statements that Burmeister's types and a pair from Uhler come from Philadelphia, although, curiously enough, Burmeister's original description states of this species "Vaterland unbekannt."

HENRY SKINNER, *Recorder*.

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At a regular meeting of the Feldman Collecting Social, held February 17, 1909, at 1523 South Thirteenth Street, Philadelphia, twelve members were present. President Harbeck in the chair.

The members had a long discussion on the giving out of manuscript names, a practice which was condemned by all.

Professor Smith said, in continuation of his communication of last meeting, that over 2000 nests of Brown Tail Moth had been found in New York. In New Jersey only a few and not bulk of the importations have been examined and about fifty so far were found; has extended south to Virginia and west to Ohio—has been found in Pennsylvania at Meehan's Nurseries. Egg masses of the Gypsy Moth were also found in Ohio. In

European countries the number of moths is terrific. It is almost impossible to keep track of the nursery shipments and where they come from, as the Custom House officials pass the packages without remarking on their contents. Discussed by the members. Professor Smith said, upon inquiry, the species was widely distributed in Europe and Asia. It has been established here about fifteen years and the Gypsy Moth longer.

Mr. Wenzel exhibited his collection of *Cryptocephalinae*, *Phaeneus* and other groups, pointing out many new and interesting species. Also said that *Dendroctonus frontalis* Zimm., which did so much damage in West Virginia and was finally wiped out, has made its appearance in Virginia.

Mr. C. T. Greene exhibited the following species of Diptera: *Tachydromia fenestrata* Say, *Pipiza radicum* W. & R. and *Chilosia similis* Coq.

Professor Smith said *Cecropia* cocoons were exceedingly scarce in New Jersey and Long Island—where in former years hundreds could be collected, now only a few can be found. Mr. Wenzel said he had noticed the scarcity in this neighborhood.

GEORGE M. GREENE, *Secretary*.

A meeting of the Newark Entomological Society was held in Turn Hall on December 13, 1908. President Wormsbacher was in the chair and thirteen members were present.

The election of officers for the ensuing year (1909) resulted as follows:

*President*, Henry Wormsbacher, re-elected.

*Vice-President*, Edwin Bischoff.

*Secretary*, John A. Grossbeck, re-elected.

*Financial Secretary*, H. H. Brehme, re-elected.

*Treasurer*, George J. Keller.

*Librarian*, William H. Broadwell, re-elected.

Mr. Bischoff spoke at length on the habits of the Scolytid beetles and their near relatives and exhibited two boxes of specimens representing nearly all the species occurring in New Jersey. He remarked on the ability of certain species when



pursued to bore into the heart of the tree so rapidly as to almost defy capture; also on the sense by which they are enabled to locate trees soon after being felled. The perspiration of the human body serves to attract them in no slight degree, and especially is this so at the approach of dusk.

Mr. Buchholz stated that numerous specimens of a *Prionus* are sometimes present on the walks in Arizona, where their dead bodies frequently render the pavements slippery.

Mr. Bischoff said that he found many larvæ of *Lucanus dama* boring into the roots of an unidentified tree. They were present throughout the roots as far into their ramifications as their thickness would allow.

Mr. Brehme read a paper on his experience in collecting dragon-fly larvæ. In his search for mosquito larvæ he discovered several small depressions in the bed of a flowing stream, and in these hundreds of specimens were taken in a few hours. In one instance eleven examples were secured with a single dip of a small hand net.

JOHN A. GROSSBECK, *Secretary*.

---

The January meeting of the Newark Entomological Society was held at Turn Hall on January 10, 1908, with seventeen members present.

Mr. Grossbeck spoke on the life habits of dragon-flies in general. He believed that the large eyes of the nymphs served as little more than cases for the developing compound eyes of the adult, since experiments carried on by him showed that they were unable to differentiate between the animate and inanimate and repeatedly grasped small sticks and leaves twirled near them with a medicine dropper. A small Curculionid beetle was struck at whenever it was forced within reach of the extensile labium, but as soon as it was stunned and remained quiet it was left unmolested, though put directly against the jaws of the nymph; again, the beetle recovering, it was immediately snatched.

Supplemental to Mr. Grossbeck's remarks Professor Smith outlined the peculiar manner in which copulation was effected.

He also spoke on the antiquity of the dragon-flies and the enormous size attained by some of the primitive species.

Mr. Bischoff exhibited his collection of Cicindelidæ and remarked on the habits of some of the species. Among the New Jersey species were two specimens of *C. consentanea* taken at Lakehurst on July 4th.

Mr. Wormsbacher showed a cocoon of *Tropaca luna* which contained two pupæ.

JOHN A. GROSSBECK, *Secretary*.

---

The February meeting of the Newark Entomological Society was held February 14, 1908, with twenty members present.

Mr. Buchholz spoke on the genus *Eubaphe* and exhibited his collection, which contained nearly all the North American species. His remarks were confined chiefly to the constancy and variation of the different species and the regions in which they respectively occurred. A specimen of *E. opella* var. *nigricans* was shown which was taken at Jamesburg on July 4th. Mr. Grossbeck also had two specimens of this variety taken at Milltown on July 7th.

Professor Smith's collection of *Eubaphe* also contained nearly all the described species. He expressed a doubt as to the rank of some of the supposed varieties of *aurantiaca*, believing some might be proved to represent distinct species by rearing.

Mr. Buchholz said he expected to raise the local species this coming summer.

Mr. Grossbeck showed bred specimens of *Tholeria reversalis* Gn. The larvæ occurred in numbers on Common Wild Indigo (*Baptisia tinctoria*).

JOHN A. GROSSBECK, *Secretary*.

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A meeting of the Rhode Island Entomological Society was held in the offices of the Providence Forestry Company on January 25, 1909, at 8 o'clock.

In the absence of President Reynolds, Vice-President Kingsford took the chair until the arrival of the President.

After the minutes of the previous meeting had been read and

approved, Mr. E. H. Armstrong, through whose courtesy the society is allowed to meet in the offices of the Providence Forestry Company, presented the society with a year's subscription to the ENTOMOLOGICAL NEWS, Canadian Entomologist and a continuous subscription to "Seitz's Macrolepidoptera of the World."

It was voted by a quorum of the original Rhode Island Entomological Society that all money in the hands of the treasurer of that society be turned over to the treasurer of the present society, Mr. Eddy.

A new member, Mr. Simmonds, was admitted to the society. He exhibited a fine specimen of *Plusia balluca* which was greatly admired.

Mr. Nyler exhibited the hibernating larvæ and cases of *Acinnus melsheimeri*.

Mr. Billson exhibited a number of fine specimens of *Noc-tuidæ*, *Geometridæ* and *Notodontidæ*.

It was voted that all members bring a check list of all their *Rhopalocera* at the next meeting.

After looking at a series of slides through Mr. Armstrong's microscope the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

---

A meeting of the Rhode Island Entomological Society was held in the offices of the Providence Forestry Company, February 8, 1909, at 8 o'clock. Eight members were present.

In the absence of President Reynolds, Vice-President Kingsford called the meeting to order.

After the minutes of the previous meeting had been read and approved, the Secretary read a letter from Dr. Skinner, extending his best wishes to the new society.

The treasurer then reported that he had collected the money remaining in the treasury of the original Rhode Island Entomological Society, as had been voted at the previous meeting, the amount being \$3.68.

A new member, Mr. C. H. Luther, of Providence, was admitted.

A vote for the adoption of a check list was taken, which resulted in favor of Dyar's.

After a social talk on subjects pertaining to entomology the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

---

The January, 1909, meeting of the Heink Entomological Club, St. Louis, Mo., occurred at the residence of Mr. Charles L. Heink, who presided. Mr. William R. Schneider was a visitor, and toward the close of the session was unanimously elected to membership.

Mr. Knetzger exhibited a specimen of *Euchistus servus*, which flew into an open window, settling on his dining table, on January 3d. He also showed a number of freaks, including *Pyrameis cardui*, supposed to be var. *elymi*; *Lycaena comyntas* ♀ with irregular pale blue blotches on the wings; *Euphyes verna* with lunate indentations in the margins of the wings, the fringe accurately following the indentations, and a *Phyciodes nycteis* of very pale color, suggesting albinism.

Mr. Heink displayed *Catocala junctura*, taken at Cliff Cave, Mo., a new record for this vicinity; also specimens of *Apanthesis persephone*, *anna* and *figurata*, all taken here.

Mr. Schroers showed a live young grasshopper taken at Creve Coeur Lake, Mo., January 22d. He reported capturing a noctuid the same day, which, however, managed to escape.

Mr. Schneider entertained the members with interesting reminiscences of his early collecting days in St. Louis, at a time when a man with a collecting outfit was considered "bug house, sure enough."

The February, 1909, meeting of the Heink Entomological Club occurred on the 21st, Mr. Heink presiding. Mr. George Hosenfeldt was a visitor.

Mr. Schroers showed a specimen of *Ampelophaga cnotus*, taken at Creve Coeur Lake, Mo., June 11, 1908; also a series of *Pholus achemon*, showing considerable variation in the shading of colors; *Pholus lycaon* and *pandorus*; a fine pair of *Hypna epigena* and *Anaea troglodyta* var. *cubana* from Cuba.

Mr. Hosenfeldt exhibited his celebrated five-winged *Samia cecropia*. This is a large and fully developed specimen, with all wings perfect. The extra wing is a hind wing on the left side, being fully as large as its twin, each of the twins, however, being slightly smaller than the normal hind wing on the right side. He also showed a melanic specimen of what is presumed to be *Pieris oleracea*, taken at Horse Shoe Lake, Ill.; and a fine specimen of *Calephelis borealis*, taken at Cliff Cave, Mo., and probably marking a new record for this vicinity.

Mr. Heink exhibited an interesting variation of *Lycacna lucia* and a new *Phyciodes*, which he has not yet had determined.

AUG. KNETZGER, *Secretary*.

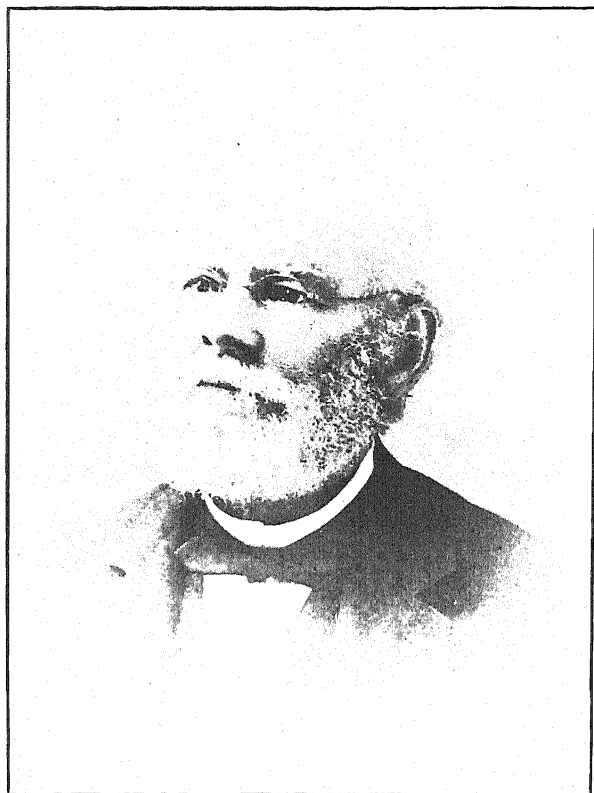
A regular meeting of the Entomological Section, Chicago Academy of Science was held Feb. 18th at the John Crerar Library. Attendance eight. Messrs. Healy, Liljeblad, Beer, Neubarth and Kwiat exhibited their collections of *Heliothis*, *Schinia* and allied genera and compared notes. Beginning with *Ipimorpha* the species reported as having been taken locally, are as follows: *Ipimorpha pleonectusa*, *Chloridea virescens*, *Heliocheilus paradoxus*, *Heliothis armiger*, *H. umbrosus*, *H. phlogophagus* (Healy 1, Kwiat 1), *Alaria gaurae*, *A. florida*, *Schinia trifascia*, *S. mundina* (Healy 1), *S. lynx*, *S. sanguinea* (Kwiat 1), *S. jaguarina* (Neubarth 1), *S. arcifera*, *S. spraguei*, *Lygranthoecia bicuspidata* (?) (Kwiat 1, Beer 1), *L. marginata*, *L. imperspicua*, *L. constricta* (Healy 1), *L. brevis*, *Heliolonche indiana* Sm.

Mr. Kwiat also reported that *Trileuca gulnare*, described by Strecker as *Schinia gulnare* from Illinois, was first taken by Vollbrecht at Starved Rock, which is about 100 miles from Chicago on the Illinois River. The specimen is now in the Strecker Collection at the Field Museum in Jackson Park, Chicago.

It was decided to take up the succeeding genera of Lepidoptera to and including *Anomis*, at the March meeting.

A. KWIAT, *Recorder*.





WILLIAM H. EDWARDS.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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### William H. Edwards.

(Plate IX.)

This distinguished naturalist died at his home in Coalburgh, West Virginia, on April 4th in his 88th year. He was born in Hunter, Greene County, New York, on March 15, 1822, and was the son of William W. and Helen Ann Mann Edwards. Having been graduated from Williams' College in the Class of 1842, he was admitted to the New York Bar in 1847. One year previous to this he made a voyage up the Amazon River to collect objects of natural history. In 1851 he married Catherine Colt Tappan. He was the author of "A Voyage up the Amazon" (1847); Shaksper not Shakespeare (1900) and compiled a genealogy of the Edwards' family in 1903. His home was at Coalburgh, West Virginia.

The monument to Wm. H. Edwards will be the three volumes he published "The Butterflies of North America," commenced in 1868 and completed in 1897. This work is one of the greatest ever published on the subject, and it has been the source of authoritative information on American diurnal Lepidoptera as a whole for nearly half a century. The author's contributions to our knowledge of life histories marks an epoch in Lepidoptera, and are of very great importance from a scientific standpoint.



Mr. Edwards says in the first volume: "It is a matter of regret that, in so few instances, I shall be able to say anything of the larvae. Even among our old and common species, the larvae are but little more known than in the days of Abbot, seventy years ago." In the preface to the second volume, dated 1884, he says: "All this is changed, and today it can be said that the preparatory stages of North American butterflies as a whole are better known than are those of Europe." This was made possible by an important fact made known by Mr. Edwards. He further says: "In 1870 I discovered an infallible way to obtain eggs from the female of any species of butterfly, namely, by confining her with the growing food-plant. If the eggs mature they will be laid."

He was a careful and painstaking naturalist and his descriptions of species are admirable, and he described many new and interesting one in addition to making known so many life histories. These books are also mines of information on the habits of these insects, as observations on such matters were sent to the author from every part of the United States and Canada. The illustrations were drawn on stone by Mrs. Mary Peart who had no superior in this line of work. His other contributions nearly all appeared in the Proceedings and Transactions American Entomological Society, Canadian Entomologist, or in *Papilio*, and were always replete with new facts and information.

By far the greater part, if not all, of the species described by Mr. Edwards will stand. He has been criticised for describing too many species of *Argynnis*, but in view of the fact of the great difficulties presented by these butterflies he was probably justified in so doing. He contended that after he described a species its true status would eventually be made out. Mr. Edwards was unquestionably the greatest Lepidopterist this country has produced, and his great work on American butterflies is and always will be a classic one. His work on life histories has never been surpassed, and when we think that all these valuable contributions to science were carried out during the spare time of an otherwise busy man, they are all the more admirable. He published in all about two hundred papers

## A new species of *Dolichopsyllus*—a genus of the Siphonaptera.

By Passed Assistant Surgeon CARROL FOX, P.H. and M.H.S.,  
San Francisco, Cal.

### *Dolichopsyllus bluei* spec. nov.

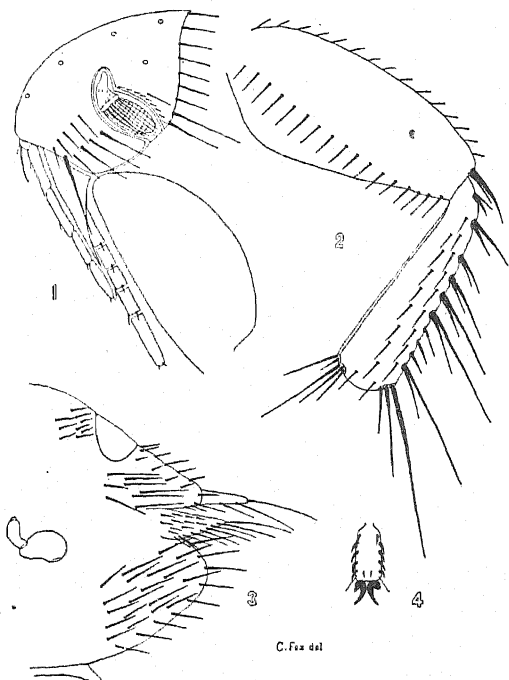
Three female specimens collected in November, 1908, from the weasel *Putorius xanthogenys*. No male specimens were obtained. Mr. Rothschild has kindly looked at this flea and pronounced it probably a new species of the genus *Dolichopsyllus*.

*Female*.—Head evenly and abruptly rounded. Frontal notch distinct. Gena ending posteriorly in an obtuse point. Maxilla triangular. Eye absent. Maxillary palpi reach to about middle of anterior coxa; length of joints, 9, 9, 6, 7½. Labial palpi reach almost to apex of anterior coxa. Five jointed, including undivided basal portion. Lower genal row consists of five bristles, the outermost one the longest and the second the smallest. Five bristles in the upper genal row. About eighteen bristles on hind margin of head, of which the two at the lower posterior angle are the largest. One small bristle on the occiput back of the middle of the antennal groove. Numerous fine hairs along the posterior margin of the antennal groove. Antennal groove extends to one-third of top of head. It is narrow, with somewhat thickened edges. A few fine hairs on first joint of antenna, while on the second joint there are about eight hairs longer than the third joint. Just in front of the insertion of the maxillary palpus there are two bristles. The pronotum contains a row of about fourteen bristles, the lowest of which is much the largest and posteriorly a ctenidium of about twenty or twenty-two spines. The mesonotum has three rows of bristles, an anterior of about twenty-four, a posterior of about sixteen small, with a middle row of about sixteen large bristles. The metanotum contains a posterior row of about sixteen large bristles and an anterior row of about twenty smaller ones. The pleura of the mesothorax contains numerous stout bristles. The episternum of the metathorax contains three large and two small bristles, the sternum three bristles, and the epimerum about sixteen or eighteen, more or less regularly disposed in three rows. The abdominal tergites have each two rows of bristles, the first tergite about sixteen in the posterior row and about the same number in the anterior row. The other tergites have in the posterior row about twenty-four large and in the anterior row about twenty smaller bristles. There is a small tooth on each side of the metathorax and the first and second abdominal tergites. There are three antipygidial bristles on each side. The sternites from the third to seventh have two rows of bristles, a posterior of about sixteen large and an anterior of from eight to ten smaller. On the second sternite there are ven-

trally four or five small bristles, while higher up there is a patch of about twelve. The fore coxa contains numerous bristles. The fore femur has on its inner surface two bristles, while its outer surface contains about twenty fine bristles. The mid femur contains a row of bristles on its outer and inner surfaces, the outer row containing about twelve and the inner row about 8 or 10. The hind femur contains a row of about seventeen bristles on its outer surface, and a row of about the same number on its inner surface. The legs are very bristly. The posterior tibia contains on its posterior border seven groups of spines in pairs, and an apical group consisting of three spines, while between the sixth and seventh paired groups there are three single spines. The outer surface contains two rows of about 8 or 9 bristles each. The longest of the apical bristles of the second hind tarsal joints reaches to the fifth. There are five lateral spines on the last tarsal joints of all the legs, the first pair being slightly dislocated towards the median line. There are also on all these joints a pair of subapical bristles and hairs.

*Modified Segments.*—The end of the abdomen is very bristly. The eighth tergite contains above the sensory plate about ten small bristles, while laterally below the sensory plate there is a group of about eight stout bristles. Below this there is a patch of thirty bristles, some of which are on the apical margin. The stylet is long, narrow, much slenderer at the tip than at the base. At the tip there is one long, slender bristle and two more, a large and a small, come from its under margin. The sub-stylar flap has on its tip and margin numerous long slender bristles.

Length 4.12 mm. Color, very dark brown.



1. Head of female; 2. Hind femur and tibia; 3. Genitalia of female; 4. Fifth tarsal article of hind leg.

*C. Fox del*

## Notes and Descriptions of Wasps of Genus *Tachytes*.

By S. A. ROHWER, Boulder, Colorado.

Before proceeding I wish to thank Rev. G. Birkmann of Fedor, Texas; Mr. C. T. Brues of the Public Museum of Milwaukee, and Prof. C. P. Gillette of the Colorado Agricultural College for supplying most of the material upon which this paper is founded. Unless otherwise stated, the types of the new species described herein are in the author's collection.

In my work on this genus I have found the color of the pubescence on the pygidium of the female to be constant and of service in separating species. The species of Boreal North America may be grouped as follows: (the females of *spatulatus* Fox, *parvus* Fox, *exornatus* Fox and *basirufus* Roh. are unknown):

SILVERY—Section 1.	BRONZY—Section 1.	GOLDEN—Section 1.
<i>validus</i> Cress.	<i>mandibularis</i> Cress.	<i>calcaratus</i> Fox.
<i>harpax</i> Patt.	<i>fulviventris</i> Cress.	<i>calcaratiformis</i> Roh.
<i>breviventris</i> Cress.	<i>crassus</i> Patt.	<i>praedator</i> Foh.
	<i>pepticus</i> Say.	<i>dubitatus</i> Roh.
	<i>propinquus</i> Roh.	<i>columbiae</i> Fox.
Section 2.	Section 2.	Section 2.
<i>mergus</i> Fox.	<i>aurulentus</i> Fabr.	<i>rufofasciatus</i> Cress.
	<i>contractus</i> Fox (?)	<i>obductus</i> Fox.
	<i>distinctus</i> Sm.	<i>birkmanni</i> Roh.
	<i>sericatus</i> Cress.	
	<i>abdominalis</i> Say.	
	<i>obscurus</i> Cress.	

### *Tachytes basirufus* n. sp.

♂.—Length 11 mm.; length of anterior wing 9 mm. Anterior margin of the clypeus broadly produced in the middle, with a small side tooth; the process slightly emarginate in the middle; surface of clypeus rather coarsely punctured. Vertex finely closely punctured; the impressed line distinct, but not strong. Space between the eyes at the top a little less than the length of antennal joints 3 + 4. Antennal joints 3 and 4 of equal length, somewhat narrowed towards the base; apical antennal joints simple. Dorsulum punctured like the vertex. Scutellum a little more sparsely punctured than the dorsulum; not impressed. Metanotum granular, middle line not strong; fovea at apical middle distinct, transversely by a small carina. Posterior face of metathorax finely, transversely striated; middle line distinct. Venation normal. Fore coxae and femora

simple. Tibiae and tarsi rather strongly spined; first joint of hind tarsi equal to  $2 + 3$ ; first joint of middle tarsi about equal to  $2 + 3 + 4$ . Abdomen finely, closely punctured; ventral segments beyond the third with larger, sparser punctures; emargination of the last ventral plate broad round.

Black; palpi, three apical joints of tarsi rufous; tegulae pale testaceous; eyes (dry) green; two basal segments of the abdomen clear red. Wings hyaline, iridescent; venation ferruginous. Face, clypeus, thorax, legs beneath, abdomen (more strongly so towards the apex) with silvery pubescence. Pygidium with pubescence yellowish. Abdomen beneath with some long reddish hairs.

*Hab.*—Livermore, Larimer Co., Colo., alt. 6000 ft., July 3, 1900. Type in the collection of Colorado Agric. College.\*

This species is quite distinct. It belongs to Fox's Section 1 and runs to *T. pepticus* Say, from which it differs in the color of the abdomen, the yellow hair of the pygidium, the different emargination of the eight ventral abdominal segments.

***Tachytes propinquus* n. sp.**

*T. crassus* Patt., Roh., ENT. NEWS, May, 1908, p. 224, in part.

♀.—Length 16 mm.; length of anterior wing 11 mm. Robust. Anterior margin of the clypeus in the middle produced into a rather narrow process which is slightly emarginate; three distinct lateral teeth; clypeus not at all carinated, closely punctured, except on the anterior margin. Front and vertex finely closely punctured; an indistinct furrow from anterior ocellus to near base of antennae; ocellar area parted by a very fine furrow; middle femora of the vertex very faint. Distance between the eyes at the top equal to the length of antennal joints  $2 + 3$ , perhaps a little greater. Third antennal joint a little longer than the vertex; scutellum not impressed. Metathorax, except anterior part of the metapleurae which is shining and smooth, finely granular; a distinct rather wide furrow from base of metanotum to lower part of posterior face; this furrow does not broaden noticeably anywhere. Metathoracic spiracles about three times as long as wide, rounded at the ends. Second and third cubital cells about equal width on the radial nervure. Tibiae and tarsi rather strongly spinose. Longest spur of hind tibiae about equal to the length of the first joint of hind tarsi. First joint of hind tarsi a little shorter than the length of  $2 + 3$ . Abdomen broad at base, tapering to an more or less acute apex; dorsally finely closely punctured; ventrally more shining, the first two segments closely punctured, the remaining strongly, closely punctured at apex, smooth and shining at the base. Pygidium rather more acute than usual, very slightly contracted apically.

\* Since the above was written I have taken three males of this species at Boulder, Colo., Aug. 1 and 4, 1903. The eyes in life are dark green.

Black; mouth part, mandibles, tegulae, apex of femora and legs below rufo-ferruginous. Wings yellowish hyaline; venation ferruginous. Face, clypeus, thorax (more especially the pectus) with fulvous hair and pubescence. Dorsal abdominal segments along the apical margins of segments 1-4 with silvery pubescence. Base of first abdominal segment with long gray hairs. Tibiae and tarsi with golden hair. Pygidium with black and reddish bronze colored hair. Venter with a few long bristle-like reddish hairs.

*Hab.*—Boulder, Colorado, August 26, 1906 (S. A. Rohwer). Eyes in life lemon-yellow. A ♂, Van Cortlandt Park, N. Y., July 25, '03, bearing numbers 25902 and 724 Public Museum, Milwaukee.

This species is nearest to *T. praedator* Fox, but it differs as follows: the anterior margin of the clypeus does not have two lobes in the middle, the scutellum is not impressed, the metanotum is more strongly furrowed, the abdomen is broader at the base, the pubescence of the pygidium is not nearly so bright, the pubescence of the head and thorax is not bright golden, and the wings are slightly yellowish.

It is also related to *T. calcaratus* Fox, but the fourth and fifth antennal joints are equal, the scutellum is not impressed, furrow of the metanotum is stronger, there is no fovea on the metanotum, the longer spur of the hind tibiae is not so long, pubescence of the pygidium not golden, etc.

The medial produced portion of the clypeus is not strong, and at first this was mistaken for a variety of *T. crassus* Fox, but the metanotum is without a "pyriform fovea" at the apex, and there are four silvery bands on the abdomen instead of three.

The New York specimen has the middle tooth of the clypeus more distinct, but otherwise seems to be the same.

***Tachytes birkmanni* n. sp.**

♀.—Length 10 mm.; length of anterior wing 7 mm. Anterior margin of the clypeus broadly, slightly produced in the middle; the produced portion is rounded, entire; at the side of the produced portion are two rather small teeth; clypeus punctured with large, somewhat irregular punctures. Front and vertex closely punctured; furrow from anterior ocellus to base of antennae; ocellar area parted by a strong furrow; occiput seen from behind depressed by the strong medial line. Distance between the eyes at the top greater than the length of antennal joints 2+3,

but less than the length of joints 3 + 4. Third antennal joint a little shorter than the fourth; fourth and fifth equal or the fifth the shortest; apical joint about the same length as the preceding. Dorsulum and scutellum finely, closely punctured; scutellum slightly impressed. Metanotum finely granular, with a very faint medial line, fovea at the apex wanting; bounded on the posterior margin by a line like series of foveae, which meet in the middle in the form of a broad V. Posterior face more coarsely granular, middle line stronger. Third cubital slightly broader on the radial than the second cubital is. Longer spur of the hind tibiae about as long as the first joint of hind tarsi; first joint of hind tarsi not much longer than the second. Abdomen dorsally microscopically punctured; punctures on the first two ventral segments similar to those on the dorsal surface; apical margin of the second ventral segment smooth, shining; apical part of segments 3-6 beneath with close punctures; apical margins of the ventral segments with some long bristle-like hairs. Pygidium rather truncate at the apex.

Black; palpi and apical joints of tarsi brownish; tegulae testaceous; abdomen clear red, apical segments slightly darker. Wings clear hyaline, iridescent; venation pale brown. Face, clypeus, mandibles, cheeks, thorax (more especially the plurae and pectus), inside of four anterior femora, tibiae and tarsi, apical two-thirds of inside of posterior tibiae (the basal third has golden pubescence), apical margin of abdominal segments 1-4 with silvery pubescence. The pubescence of the abdomen is not very dense. Pygidium with dense golden pubescence.

*Hab.*—Lee Co., Texas, May, 1907 (G. Birkmann).

I take great pleasure in naming this handsome little wasp after an energetic collector, Rev. G. Birkmann.

This species looks very much like a *Tachysphex*, but the appressed hair on the pygidium at once excludes it from that genus.

It undoubtedly belongs to Section II of Fox. In his table for this section it runs to *obductus* Fox, but it is very different from this species. Besides the difference in color from *obductus* the third antennal joint is shorter, the scutellum is impressed, the metanotum does not have a distinct fovea, etc.

*T. rufofasciatus* Cress. is the only other described species of the section which has black legs and a rufous abdomen, so a comparison with it may be useful. *T. birkmanni* may be known from *T. rufofasciatus* Cresson by its smaller size, the impressed scutellum, the metanotum with a slight furrow, pubescence silvery instead of golden, and the presence of two lateral teeth on the anterior margin of the clypeus.

**Tachytes praedator** Fox.

Three females and three males, Lee Co., Texas (G. Birkmann). The scape and mandibles are black sometimes. The femora of all the specimens before me are ferruginous for the apical two-thirds.

**Tachytes mandibularis** Patt.

Female, Fedor, Texas, Oct. 11, 1905 (G. Birkman). This is 19 mm. long, and the femora are largely ferruginous. It seems to agree otherwise.

**Tachytes pepticus** Say,

A ♂, Wellsville, Kansas, August 3, 1901 (S. A. Johnson), is almost typical. It is in the collection of the Colorado Agricultural College. Many males collected at Fedor, Texas, by Rev. G. Birkmann. Also two females from the same locality. These are not typical and may represent a distinct species. A ♂, Boulder, Colorado, July 20, 1908 (S. A. Rohwer), had the eyes in life bright green below and darker above.

**Tachytes aurulentus** Fabr.

A ♂ and ♀, Lee Co., Texas, August, 1907, and a ♀ same locality, Sept. 6, 1907 (G. Birkmann). The wings are much darker than usual for this species, being almost black. The last mentioned ♀ has the anterior margin of the clypeus slightly more acute at the middle and the pubescence of the front is golden.

**Tachytes obductus** Fox.

A ♀, Fedor, Texas, August, 1905, ♀ Lee Co., June, 1906 (G. Birkmann). New to Texas.

**Tachytes distinctus** Sm.

Three females and three males, Lee Co., Texas (G. Birkmann); 2 females, Paris, Texas (C. R. Jones); ♂, Wellsville, Kansas, Aug. 16, 1901; ♂, Julesburg, Colo., August 4, 1899. The last four are in the collection of the Colorado Agricultural College. The pubescence in some of the specimens is golden instead of silvery.

I take the opportunity to correct a mistake made by myself in the ENT. NEWS, May, 1908, p. 224. The ♂ recorded from Roswell, N. M., as *T. crassus* Patton is a ♂ of *T. distinctus* Sm. So far *T. crassus* has not been taken in New Mexico.



***Tachytes rufofasciatus* Cress.**

Many males and females from Lee Co., Texas, collected from June to September (G. Birkmann). The females vary greatly in size. The abdomen of the male in many of the specimens is black, with the apical margin testaceous. The wings are yellowish hyaline, nervures pale testaceous. The spines on the tibiae are white.

***Tachytes obscurus* Cress.**

Three females and six males, Lee Co., Texas, June to Aug. (G. Birkmann). The females are typical, but the males do not quite agree with Fox's description. They are undoubtedly the ♂ of the ♀ which agrees. The elongate process on the fore coxae is very short and there is a long bristle-like hair, which is white, at the apex of each. The abdomen has more silvery pubescence than the ♀.

***Tachytes dubitatus* n. sp.**

♀.—Length 13 mm. Anterior margin of the clypeus produced in the middle into a broad lobe which is slightly emarginate; at the sides there are three small teeth, the outer one much more distinct, the inner one is very small; the above description is from the under side, from above it is not so plain. A distinct furrow from anterior ocellus to base of antennae, this is obscured by the hair of the front. Depressed area behind lateral ocelli not strong; the vertex is not parted by a furrow. Vertex with large, separate punctures along the orbits, over the entire vertex are small, rather close punctures. Sparse between the eyes at the top, not quite as great as the length of antennal joints 2 + 3. Third antennal joint a little longer than the fourth; the fourth and fifth joints equal in length; apical joint a little longer than the preceding one. Dorsulum distinctly, although not strongly, rather closely punctured. Scutellum more finely punctured, slightly impressed. Metanotum rather coarsely granular, a rather indistinct median furrow which is at the apex broadened into a rather shallow fovea. Posterior face more finely granular, the middle furrow distinct. Metathoracic spiracles about the same as those of *propinquus* Roh. Tibiae and tarsi distinctly spinose. Longest spur of hind tibiae about the same length as the basal joint of the hind tarsi, if anything slightly longer. Second cubital on radial distinctly wider than third. Dorsal segments of the abdomen under the compound microscope are finely tessellated. Apical margins of ventral segments 3-6 and the side of the sixth closely punctured; along the apical ventral margin of three, four and five is a row of long brown bristles. Pygidium more acute than usual. Black; apex of mandibles and scape beneath piceous; palpi,

tegulae, legs below the extreme apex of the femora ferruginous. Wings yellowish hyaline, venation ferruginous. Front, clypeus, thorax more sparsely, femora and pygidium with golden pubescence; apical dorsal margins of segments 1-4 and ventral 2-4 with silvery pubescence.

♂.—Length 12 mm. Anterior margin of clypeus in the middle produced into a low, slightly emarginate lobe; three fairly distinct lateral teeth. Furrow from lower ocellus not as strong as in the ♀. Vertex like ♀, except there is a faint median furrow. Four basal joints of flagellum rounded out beneath, the fifth slightly so; first joint a little longer than the preceding one, straight on the inside margin, oblique on the outer margin. Thorax like ♀, except that perhaps the scutellum is a little more strongly impressed. Legs not strongly spinose. Longest spur of hind tibiae shorter than the basal joint of hind tarsi. Second and third cubitals about the same width on the radius. Eighth ventral segment narrowly angularly notched; lobes broad, obtusely rounded. Black; apical half of mandibles piceous; palpi, tegulae, knees and legs below, ferruginous. Wings yellowish; venation ferruginous. Front and clypeus with golden pubescence; thorax, femora and basal segment of abdomen with long fulvous; apical dorsal margin of abdominal segments 1-5 and ventral 2-4, also the pygidial area with silvery pubescence. In one ♂ the silvery pubescence of the fifth dorsal segment is wanting.

*Hab.*—A ♂ and ♀, Milwaukee Co., Wis., number 22322, and a ♂, Racine Co., Wis., number 24483. Types in the Public Museum of Milwaukee.

In Fox's Monograph of the North American Species of *Tachytes* [Trans. Am. Ent. Soc., xix, 1892], the female runs between *praedator* Fox and *calcaratus* Fox. From *praedator* it may be known by the smaller teeth of the clypeus; the presence of the large punctures on the superior orbits; the broader second cubital cell; the lack of such abundance of golden pubescence. From *calcaratus* it differs in having the middle furrow of metanotum not fainter than in *praedator*, but stronger; the golden pubescence of the front; and it is 3 mm. smaller. It is much like *propinquus* Roh., but the metanotum is not so strongly furrowed, the pygidium is golden, not bronzy, etc.

The above male differs in a number of points from the female but is probably the male of the described female. It was taken in the same locality. In Fox's Monograph the ♂ runs to *validus* Cress., but is smaller, the lobes of the eight ventral segments are broader; the furrow of the vertex is weaker, etc. If it should run to *calcaratus* it would be known from it

by the golden pubescence of the front, the different emargination of the eight ventral segments, etc.

**Tachytes calcaratiformis** n. sp.

♀.—Length 16 mm. Anterior margin of the clypeus in the middle produced into a rather strong emarginate tooth; sides of the clypeus with three distinct lateral teeth. Except where mentioned, this species is like *propinquus* Roh. Metanotum but very slightly sulcate, with a distinct fovea at the apex; dorsal abdominal segments more coarsely sculptured; ventral segments more strongly punctured; pubescence of the clypeus silvery or slightly golden.

♂.—Length 17 mm. Slender. Anterior margin of the clypeus not produced in the middle, laterally with three rather small teeth. Except these points it is different from the female; middle sulcus of the vertex stronger; scutellum impressed, middle furrow of metanotum not quite as strong; the pygidium does not have a golden tint. Emargination of the eight ventral segments rounded, perhaps a little deeper than *breviventris* Cress., but very similar.

*Hab.*—Two males and one female, Van Cortlandt Park, N. Y., September 12, '03, numbers 25902 and 932. Types in the Public Museum of Milwaukee.

The female is almost like *Calcaratus* Fox, differing only from Fox's description in not having the scutellum impressed, and having the pygidium more silvery.

The male is also close to *calcaratus* Fox, but the teeth of the clypeus are more distinct; the lobes of the eight ventral segments are straight on the outer margin, and the emargination is deeper—more like *breviventris* Cress. From *breviventris* it may be easily known by the longer spur of the hind tibiae being longer than the basal joint of the hind tarsi.

*Calcaratus* Fox, *propinquus* Roh., *dubitatus* Roh. and *calcaratiformis* Roh. are all closely related. They are not as distinct species as most of the other described *Tachytes*, yet I do not think that they are varieties. They may be separated as follows:

Males . . . . .	1.
Females . . . . .	3.
1. Emargination of the eight ventral plate narrow, not very deep, lobes broad; front with golden pubescence . . . . .	<b>dubitatus.</b>
Emargination of the eight ventral plate much broader; front with silvery pubescence . . . . .	2.

2. Lateral margin of the lobes of the eight ventral abdominal segments curved ; clypeus with two lateral teeth . . . . . **calcaratus**.  
Lateral margin of the lobes of the eight ventral abdominal segments straight ; clypeus with three lateral teeth . . . . . **calcaratifformis**.
3. Pubescence of the pygidium bronzy . . . . . **propinquus**.  
Pubescence of the pygidium golden or with a golden tint . . . . . 4.
4. Front with golden pubescence (scutellum slightly impressed).  
**dubitatus**.
- Front with silvery pubescence . . . . . 5.
5. Scutellum impressed ; pubescence of pygidium bright golden.  
**calculus**.  
Scutellum not impressed ; pubescence of the pygidium with a silvery appearance . . . . . **calcaratifformis**.

**Tachytes obscuranus** n. sp.

♀.—Length 8 mm. Anterior margin of the clypeus gently rounded, at the sides with a very large tooth, outside of these large teeth are two very small teeth ; about half-way up on the clypeus and directly above each of the large lateral teeth is a tooth-like projection ; inside of the tooth-like projection is a smaller one ; clypeus is closely punctured. A distinct shining line from lower ocellus to base of antennae. Front sparsely punctured ; interocellar area closely punctured ; vertex with some large punctures near the orbits, the rest finely tessellated. Occiput seen from the front slightly depressed ; the middle line of the vertex distinct. Space between the eyes at the vertex not as great as the length of the antennal joints 2 + 3. Scape long, narrow, more like *Tachysphex* ; antennal joints 3, 4 and 5 of equal length. Dorsum closely punctured. Scutellum a little more sparsely so ; not impressed. Metanotum somewhat shining, very finely sculptured, the middle line distinct, at the apex it broadens into a shining, triangular fovea ; posterior face with an elongate fovea ; metapleurae shining. Legs rather strongly spinose ; spines on the posterior tibiae pallid, long, acute ; longer spur of posterior tibiae as long as the basitarsus. Radial cell rounded at the apex ; second cubital a little broader on the radius than third cubital. Abdomen dorsally finely tessellate ; second ventral segment mostly closely finely punctured or tessellate ; third and fourth segments with large punctures. Pygidium sparsely punctured with large punctures. Black ; mandibles, spot on scape beneath, apical joints of tarsi rufous ; tegulae ferruginous. Front, clypeus, femora, tibiae, plurae, pectus, abdomen dorsally (more strongly so on the apical margins) with dense silvery pubescence ; metathorax with long white hairs. Pygidium rather sparsely clothed with silvery hairs. Wings hyaline, slightly yellowish, iridescent ; venation ferruginous.

♂.—Length 7 mm. Clypeus very slightly produced medially, with the lateral angles a little produced so as to give it a wavy appearance. Emargination of the fore femora beneath shallow. Spine on the fore coxae short, with a long white bristle at the apex. Emargination of eight ven-

tral plate deeply angular. Abdomen closely, rather strongly punctured, metathorax finely granular. Venation brown, wings not yellowish. Mandibles (species piceous) and scape black. Except where mentioned this is like the female.

*Hab.*—Five females and five males, Lee County, Texas (G. Birkman). Most of them were taken in Fedor. The dates are May 28th, June 6th, 19th, 21st, 26th, August, in different years.

This species is close to *T. obscurus* Cress. The female may be known by its smaller size; the different sculpture of the clypeus, which is very distinct; the silvery color of the pygidium, etc. The male may be separated by the longer third antennal joint; the slight indicated middle line, the more angular emargination of the eight ventral plate and the close eyes.

In Fox's Monograph of the *Tachytes* of North America this species runs to *sericatus* Cress. to which it is closely related, but it may be separated from that species as follows: the clypeus of the female is different; the metanotum in the female is much different, being more shining; the pygidium is not bronzy; the longer third antennal joint of the ♂; eighth ventral abdominal plate is angularly emarginate; and being smaller in size.

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DIADASIA NITIDIFRONS AND D. SKINNERI.—The original type of the bee *Diadasia nitidifrons* Ckll., from Banning, California, has the abdomen largely denuded of pubescence. In Trans. Amer. Ent. Soc., xxxii, p. 73, I described what I regarded as a more perfect specimen of the species, taken by Dr. Skinner at Silver Lake, Utah, 8,600 ft. This was a very remarkable extension of the range, but I did not believe I had to do with a distinct species. I now have before me a perfect male of undoubtedly genuine *D. nitidifrons*, taken by Mr. Eldred Jenne at N. Yakima, Wash., June 24, 1903. This is larger than the Utah specimen and has the abdomen beset all over with erect dull white hair, without any appearance of bands. There is no black hair at the bases of segments 2 and 3, but there is some at the base of 6. The Utah insect clearly represents a distinct species (*D. Skinneri* n. sp.), peculiar for its small size (length about 7 mm.), and the black hair at the bases of abdominal segments 2 and 3. Seen from above, nearly the basal half of these two segments appears shining black, the rest of the segment being relatively dull, while the hind margins of segments 2 to 4 have evident fringes of white hair.—T. D. A. COCKERELL.

## Additional Bibliography on Flies and Mosquitoes as Carriers of Disease.\*

Compiled by WM. PAUL GERHARD, C. E.

(See also the February, 1909, issue of ENTOMOLOGICAL NEWS.)

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NOTE.—Through the kindness of several entomologists and other persons interested in Mosquito and Fly Extermination, the author is enabled to present the above addition to his Bibliography, published in the February Number. Further contributions to the bibliography would be gratefully appreciated by the author. (Address 33 Union Square, New York City.)

**A new species of *Orocharis* (Gryllidae) from British Honduras.**

BY JAMES A. G. REHN.

***Orocharis latifrons* n. sp.**

Type: ♀; Benque Viejo, British Honduras. 1907. [*Acad. Nat. Sci. Phila.*]

Allied to *O. gaumeri* Saussure from Valladolid, Yucatan, but differing in the broader rostrum, which is as broad as the proximal antennal joint instead of half as broad, and in the absence of solid black from the pronotum and angle of tegmina.

Size rather large (for the genus); form quite elongate; surface moderately hirsute. Head with its dorsal length about two-thirds that of the pronotum, occiput regularly declivent to the rostrum, slightly concave transversely between the eyes; rostrum moderately protuberant, rounded obtuse-angulate when seen from the side, the width of the rostrum about as much as that of the proximal joint of the antennae; ocelli prominent, elongate-elliptical in shape, disposed in a slightly arcuate line, the lateral ones each slightly larger than the middle one and faintly constricted in the middle; eyes moderately prominent, more so cephalad than laterad, in shape subpyriform; antennae nearly twice the length of the body, the proximal joint large, moderately depressed, slightly sinuate when seen from the side; terminal palpal joint slightly arcuate, obliquely truncate at the apex. Pronotum with the greatest caudal width about one and a half times the length, the lateral margins converging cephalad; cephalic



Dorsal view  
of head and  
pronotum.

margin emarginato-truncate; caudal margin very slightly obtuse-angulate; the angle hardly apparent and the margin slightly sinuate laterad; lateral lobes of the pronotum slightly longer than deep, regularly arcuate ventrad. Tegmina a third longer than the body, distinctly exceeding the tips of the caudal femora; costal field quite broad, proximad and mesad, much narrowed distad by the decided emargination of the costal margin, mediastine vein with about fifteen rami. Wings caudate, extending be-

yond the tegmina a distance about equal to the length of the pronotum. Abdominal styles long and tapering, about half the length of the ovipositor, the latter being slightly longer than the body, slender, slightly arcuate dorsad in the proximal half, the apex armed ventrad with blunt teeth, the immediate apex very sharp; subgenital plate obtuse-angulate emarginate at the apex. Caudal femora slightly less than the body in length, not very robust, the greatest width contained about four times in the length; caudal tibiae hardly exceeding the femora in length.

General color wood brown, the limbs slightly tinged with mars brown, the head with cinnamon-rufous, the tegmina with their neuration but little relieved from the base color, and the abdomen and ovipositor near burnt umber in tone. Eyes cinnamon; antennae of the general color, faintly annulate distad; angle of the tegmina narrowly lined with pale yellow and this finely interrupted with blackish spots and points; apex of the ovipositor blackish; limbs more or less obscurely sprinkled with minute umber spots.

#### MEASUREMENTS.

Length of body . . . . .	16. mm.
Length of pronotum . . . . .	3. "
Greatest caudal width of the same . . . . .	4.3 "
Length of tegmen . . . . .	20.5 "
Length of caudal femur . . . . .	13.5 "
Length of ovipositor . . . . .	17.5 "

The unique type was submitted to me for examination by Dr. H. T. Fernald, of Amherst, Mass.

## A New Walking-Stick of the Genus *Diapheromera* from Mexico.

BY JAMES A. G. REHN.

*Diapheromera* (*Ceratites*) *tamaulipensis* n. sp.

1904. *Diapheromera calcarata* Rehn, Proc. Acad. Nat. Sci. Phila., 1904, p. 50. [In part.]

Types, ♂ and ♀; Alta Mira, Tamaulipas, Mexico, June 28, 1903 (M. E. Hoag). [Acad. Nat. Sci. Phila.]

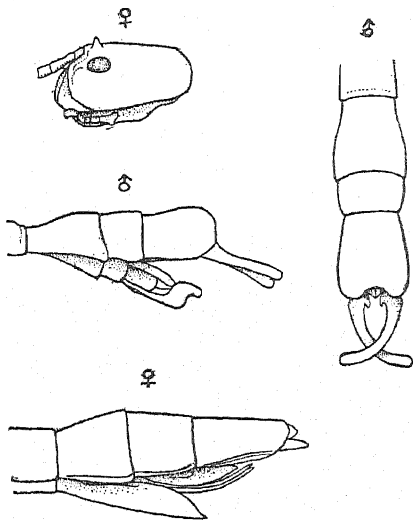
A member of the recently erected subgenus *Ceratites* Rehn and Hebard\* possessing cephalic horns† and in the male having the apical margin of the subgenital opercule ampliate. When compared with *covilleae* Rehn and Hebard, the type of

\* Proc. Acad. Nat. Sci., Phila., 1909, p. 126.

† The horns of the female type are very well marked, but none are present in the male type. As twenty-six specimens of this subgenus have been examined, and all possess horns except this male, it seems highly probable that their absence is purely accidental.

the subfamily, *tamaulipensis* is seen to be slenderer with decidedly narrower head and pronotum, more elongate abdominal segments, longer limbs and smaller eyes. When the male is compared with a male of *Diapheromera calcarata* from Jalisco, Mexico, the slender form and the subgeneric characters at once separate the two.

Size rather large; form quite slender; surface smooth. Head a half to a third again the length of the pronotum, slightly broader at the eyes than caudad, but the increase in width cephalad is slight, the greatest width slightly less than the length; occiput smooth, interocular region with a pair of low, blunt, divergent horns, each situated caudad of the articulation of the antennae; \* eyes globose, moderately prominent; proximal antennal joint somewhat depressed. Pronotum nearly half again as long as broad, subequal in the male, slightly constricted mesad in the female; medio-longitudinal sulcus slight, medio-transverse sulcus prominent, slightly arcuate caudad. Mesonotum about twice (♀) or thrice (♂) the length of the head and pronotum together; very slender and moderately expanded caudad in the male, more robust and somewhat expanded caudad in the female. Metanotum with the median segment equal to mesonotum in the male and slightly shorter in the female, similar to that segment in shape in both sexes; median segment transverse, the cephalic margin slightly arcuate cephalad. Abdomen about equal to



*Diapheromera (Ceratites) tamaulipensis* n. sp.—  
Lateral view of head of female and apices of  
abdomen of male and female and dorsal view  
of apex of male abdomen (x 4).

(♂) or distinctly longer than (♀) the head and thoracic segments, the joints decidedly (♂) or moderately (♀) elongate, the six proximal ones similar in character, but slightly decreasing in length. Male with the seventh dorsal abdominal segment distinctly longer than half the sixth segment, inflated but not much expanded laterad; eighth dorsal segment of the male transverse, not more than half the length of the seventh seg-

\* Absent in the male, but see footnote †.

ment; ninth dorsal segment of the male hardly shorter than the seventh, slightly inflated, hardly at all expanded, apical margin arcuato-emarginate; supra-anal plate of the male very short, obtuse-angulate, carinate; cerci slightly longer than the ninth dorsal abdominal segment, rounded, well curved inward toward the median line, the apical portion slightly bent, thickened and blunt, a slight, moderately acute spine at the internal base, eighth ventral segment quite short, not reaching to the apical margin of the eighth dorsal segment; subgenital opercule elongate, reaching to the apex of the ninth dorsal segment, narrow, the apex "spout-shaped," the margin bent on itself then somewhat expanded and shallowly emarginate at the apex, the lateral margins of the terminal portion of the plate arcuate when seen from the side. Seventh dorsal abdominal segment in the female, about half as long as the sixth; eighth dorsal segment slightly shorter than the seventh; ninth dorsal segment nearly twice the length of the eighth, compressed, slightly carinate dorsad at the apex, the apical margin with a rectangular median emargination, which exposes the rotundato-angulate supra-anal plate; cerci nearly half the length of the ninth dorsal segment, lanceolate-conic; subgenital opercule produced, reaching to the apical margin of the eighth dorsal segment, compressed, subequal, the apex rectangular. Limbs very long and slender in the male, the median femora inflated much as in *D. calcarata*, the limbs in the female much shorter and more robust. Cephalic femora of the male slightly longer than the pronotum and mesonotum together, tibiae slightly exceeding the femora; median femora about equal to the metanotum without median segment, tibiae distinctly longer than the femora; caudal femora reaching to the apex of the fourth abdominal segment, tibiae distinctly longer than the femora. Spine on the median femora of the male very stout; the carinae regularly but not very strongly serrato-dentate; ventral carinae of the tibiae rather strongly serrato-dentate; spine on the caudal femora slenderer and more acute than on the median femora, the carinae of the caudal femora and tibiae serrato-dentate as in the median limbs but in a less decided manner. Cephalic femora of the female about equal in length to the pronotum and mesonotum, tibiae slightly longer than the femora; median femora about equal to the metanotum with median segment, the tibiae equal to the femora; caudal femora reaching to the middle of the fourth abdominal segment, tibiae subequal to the femora. Spines on the median and caudal femora of the female much smaller than in the male, but of fair size.

General color of the male ochraceous, becoming pale oil green on the cephalic limbs, median and caudal tibiae. Apex of the abdomen prout's brown; eyes seal brown; a narrow postocular bar bistre. General color of the female seal brown, becoming wood brown on the head, prothorax, cephalic portion of the mesothorax and on the apex of the abdomen, the femora and tibiae somewhat mottled with the two shades, eyes burnt umber.

## MEASUREMENTS.

	♂	♀
Length of body . . . . .	88. mm.	77. mm.
Length of pronotum . . . . .	3.2 "	3.5 "
Length of mesonotum . . . . .	20. "	17.5 "
Length of metanotum . . . . .	20. "	15. "
(Including median segment.)		
Length of cephalic femur . . . . .	24. "	20. "
Length of median femur . . . . .	18.8 "	15.2 "
Length of caudal femur . . . . .	24.5 "	19. "

The types are the only specimens of this interesting species which have been seen by the author.

### Description of a Mexican *Aleyrodes*.

BY T. D. A. COCKERELL.

In Entomological News, 1903, I published a short note on *Aleyrodes vitrinellus*, a new species from Mexico. The full description was sent to Professor Herrera to publish in Mexico, but it was apparently mislaid or lost, as it has never appeared. It therefore seems necessary to give the particulars here, the original short note being inadequate. The species is of some importance just now, owing to the great attention being given to the Aleyrodidae of *Citrus*.

*Imago*.—Yellow; eyes undivided; a bright orange stripe (apparently internal) extends from the posterior part of the thorax to about the middle of the abdomen.

*Pupa*.—Pale yellowish or colorless, very much like that of *A. floridensis*, but larger (900  $\mu$ . long; *floridensis* is not over 700  $\mu$ .), without the dark markings, and with a longer fringe, with more rods united, so that it seems coarser; the rods are straight. Surface of pupa strongly granular; margin double, one edge crenulated and the other (upper) one crowded with regular short tooth-like pointed projections; this is a condition very similar to that of *A. floridensis*. There are more or less obvious dorsal and sub-dorsal longitudinal series of low tubercles. Margin with long radiating glass-like rods. No dorsal secretion.

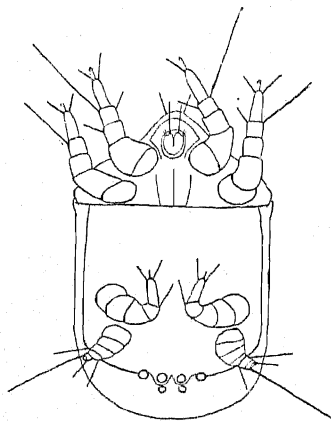
Vasiform orifice about 54  $\mu$ . long, broad-cordiform, the apex (posterior end) very faintly notched; operculum very broad, the apical margin gently convex; lingua broad spatulate, the apical portion rather obscurely crenulate. In all this there is a general resemblance to these parts in *A. variabilis*, but in *A. vitrinellus* the vasiform orifice is much broader, with the apical notch very much fainter, and the operculum is very much less pointed, while the lingua is not so strongly crenulated.

*Hab*.—Garden of Netzahualcoyotl, Texcoco, Mexico (*A. L. Herrera*, No. 700). On the under side of leaves which appear to be those of orange, with much black fungus.

## A Parasite Found on a Flea.

By Passed Assistant Surgeon CARROL FOX, P.H. and M.H.S.  
Oakland, California.

During the examination of thousands of specimens of rat fleas, there was observed on three occasions a very small mite attached to the female of the *Ceratophyllus fasciatus*. On the first occasion but one mite was present, but subsequently two females were found, one with five and the other with seven mites attached. These mites were able to move about freely on the surface of the flea, but usually seemed to cling with their hind legs or sucking discs to one segment, of the flea,



Parasite found on a Flea.

the anterior legs being free, thus permitting the other segments to move freely beneath them. At first it was thought that this might be a true parasite of the flea, possibly belonging to the family Canestriniidae, but the mere fact of having examined thousands of specimens of fleas and only encountering this mite three times would of itself negative such a possibility and it is therefore thought that the mite under consideration is probably the hypopial stage of the family

Tyroglyphidae. It is the first time I think than an *Acarina* has been reported from the *Siphonaptera*.

Unfortunately the mite was not carefully studied while alive, and after mounting it was found difficult to make out its anatomy.

Its size is .210 x .130 mm. There is a demarkation between the cephalothorax and abdomen. The mouth parts are retracted and very indistinct. There are four pairs of legs, the two anterior and the two posterior being widely separated. The first and second legs terminate in a hook, as does also probably the third. The tarsal joint of the last leg has a long hair. Some of the segments of this and the other legs also contain a few hairs. Ventrally towards the end of the abdomen are five discs, which probably serve as sucking discs.

## The Late Professor Slingerland.\*

By J. H. COMSTOCK.

Mark Vernon Slingerland, Assistant Professor of Economic Entomology in Cornell University, died of Bright's disease at his home in Ithaca, March 10th. His health had been failing for some time, but to most of his friends his death was unexpected.

Professor Slingerland was born in Otto, Cattaraugus Co., N. Y., on October 3, 1864. He was a son of Jacob A. and Mary (Ballard) Slingerland. He was educated in the Otto village school and in the Chamberlain Institute at Randolph, N. Y. In 1887 he entered Cornell, and in 1892 he was graduated with the degree of Bachelor of Science in Agriculture. He obtained special mention for special study with marked proficiency in Entomology during the last two years of his course. From 1890 till 1904 he was assistant entomologist in the Agricultural Experiment Station, and in 1899 he was appointed Assistant Professor of Economic Entomology.

Professor Slingerland was a member of the Holland Society of New York; the American Association of Economic Entomologists (of which he was president in 1903); the Entomological Association of Washington; the National Mosquito Extermination Society, and the Society of Sigma Xi (Vice-President of the Cornell Chapter in 1903 and 1904), and a Fellow of the American Association for the Advancement of Science.

Professor Slingerland married in 1891 Miss Effie B. Earll, who was a special student in the University in 1889-91. She survives him, with one daughter.

Although Professor Slingerland has barely reached middle life, he was recognized as being one of the foremost workers in economic entomology, and had attained an international reputation.

He was a prolific writer; he had published many bulletins, and had contributed much to the periodical press, especially to *The Rural New Yorker: Country Life in America*; *The*

\* This obituary by Prof. Comstock appeared in the *Journal of Economic Entomology* (2, 195, 1909), accompanied by an excellent portrait of Prof. Slingerland.



American Agriculturist; The National Nurserymen; THE ENTOMOLOGICAL NEWS and the Canadian Entomologist. He was a contributor to the Encyclopedia of American Agriculture. At the time of his death he had in preparation a volume entitled "Insects Injurious to Fruit," which was to appear in Macmillan's Rural Science Series.

The position he attained was reached by untiring industry and a devotion to truth; his work was characterized by painstaking thoroughness and an absence of anything sensational. His constant aim was to determine the exact and complete truth and to present what he discovered in a clear manner. In this he was very successful, both in the class room and as a writer.

The bulletins that he published were in a marked degree monographic. Instead of writing about many insects, he selected a few and discussed them thoroughly, working up so far as possible every detail in the life-history of the species studied. It was doubtless this feature that caused his work to be so widely known in other lands. For example, his treatise on the Codling Moth was translated into Russian and published in that language.

A striking feature of Professor Slingerland's bulletins is the excellence of the illustrations; no one else has been so successful as he in photographing entomological subjects; and his lantern slides of insects, colored by Mrs. Slingerland, are unsurpassed.

Although his work is characterized by the highest degree of scientific accuracy, he never forgot that the object of his work was to aid those that till the soil. He never allowed his interest in the purely scientific aspects of the subjects studied to cause him to neglect the practical applications of the results obtained. A marked instance of this was his invention of the "Spray Calendar;" for he devised the first tabular calendar arrangement of spraying suggestions. This was printed and used at Farmers' Institutes in 1894. The value of this method of publication was apparent at once; and it has been generally adopted by experiment stations.

Professor Slingerland took an active part in various scien-

tific and horticultural societies. He was President of the Association of Economic Entomologists in 1903; Chairman of the Entomological Section of the Association of American Agricultural Colleges and Experiment Station in 1903; Chairman of the Committee on Entomology of the Western New York Horticultural Society, 1895-1904 inclusive; and Chairman of the Committee on Entomology of the New York State Fruit Growers' Association in 1903.

As a teacher he was clear, direct and painstaking. He had the keenest interest in the needs of each individual student. Only a few hours before his death he discussed with a colleague the work of several of his students. Even at that hour his thought was not of himself but of his students.

In this manner closed the life of one who, although given but few years to work, accomplished much, and who endeared himself to others by his sterling qualities as a man and a friend.

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ORTHOPTERAN MISCEGENATION.—On October 12th, 1908, about noon, the writer was collecting in a meadow near St. Louis, Mo., when his attention was attracted by an unusual pair of grasshoppers, very dissimilar in appearance, that appeared to be *in copulo*. It was the height of the fall mating and hundreds of pairs were to be seen everywhere, but one glance at the 'hoppers mentioned showed them to belong to different species. Carefully capturing the pair they were brought into the laboratory and introduced into a dirt bottomed breeding cage, undisturbed. Here they remained, *in copulo*, for two days. The morning of October 15th, however, found them both dead in the bottom of the cage,—the immediate cause of death not apparent.

Investigation proved the male to be the common *Melanoplus femurrubrum* while the female was identified by Mr. Caudell as *Hippiscus rugosa* Scudder. Two locusts more dissimilar in appearance could hardly be imagined. Leaving out of consideration the brilliant coloration of the female in comparison with the more modest male,—the broad flat "face" and thick-set, clumsy, build of the former offers such a contrast that any amateur, let alone a grasshopper, ought to see the difference at a glance.

It is, of course, not astonishing that fertile eggs should not be laid after such a union, but it is surprising enough that it should occur at all. Hybrids between related species of locusts are doubtless more common than hitherto supposed, but if by artificially modifying natural conditions a well-known laboratory investigator can fertilize sea urchin eggs with starfish sperm it is not difficult to believe that Nature in a moment of abstraction might permit the fertilization of *Hippiscus* eggs by *Melanoplus* sperm producing thereby no one knows what complications for the faithful systematist. At any rate it would be interesting to discover if such unions are at all common occurrences in the field.—J. F. ABBOTT.

## Some Apparently New Thysanoptera from Michigan.

By A. FRANKLIN SHULL.

The species herein described were taken in Huron County, Michigan, in the summer of 1908, while I was engaged as Entomologist on the Michigan Biological Survey. As it will be some time before the complete Report of the Survey of 1908 is ready for publication, the descriptions of new species are published here with the permission of the Chief Field Naturalist, Dr. A. G. Ruthven. In the preparation of this paper I have become indebted to Dr. W. E. Hinds for assistance in determining some of the older species; to Mr. J. Douglas Hood for the loan of several of his types and for comparing another of my specimens with his own; to Mr. Dudley Moulton for a similar kindness; and to the authorities of the U. S. National Museum for the privilege of examining their collection.

The entire collection is to be deposited in the Museum of the University of Michigan.

Suborder TEREBRANTIA Haliday.

Family THIRIPIDAE Uzel.

Genus **HETEROTHIRIPS** Hood (1908).

**Heterothrips salicis** n. sp. (Fig. 1).

*Female*.—General color of body dark brown, appearing nearly black to the unaided eye by reflected light. Length of body 1 mm.; width of prothorax .21 mm.; width of mesothorax .25 mm.; width of abdomen .28 mm. Length of antennal segments 15  $\mu$ , 33  $\mu$ , 46  $\mu$ , 31  $\mu$ , 24  $\mu$ , 21  $\mu$ , 16  $\mu$ , 12  $\mu$ , 15  $\mu$ .

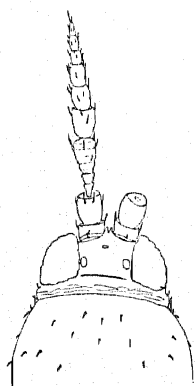


Fig. 1.—*Heterothrips salicis* n. sp.—Head, prothorax and antenna of female.

Head 2.4 times as broad as long, broadest behind. Distinct transverse striae posteriorly; other striations forming a transversely elongated reticulum near posterior margin. Cheeks behind eyes bearing several short spines directed forward. Frons deeply emarginate between antennae; prominent spine beneath base of each antenna. Eyes black, with light brown margins, projecting prominently in front beside the basal segments of the antennae; spines between facets very small. Posterior ocelli situated well back, contiguous with borders of eyes. Mouth cone short, reaching slightly beyond middle of prosternum. Maxillary palpi 3-

segmented, last segment shortest. Antennae 3.4 times as long as exposed portion of head; nine-segmented. Segments 1, 2 and 5-8 barrel-shaped; third vase-shaped, with two conspicuous constrictions and several other less distinct annuli; fourth cup-shaped; *both third and fourth are without distal circle of sensoria*; ninth cylindrical. Segments one, two, and five to nine concolorous with body; third light yellow, palest at base; fourth brownish, paler toward base than at tip. Sense cones and spines of only moderate size, not conspicuous. *Segments are closely united; articulations are brown, not clear.*

Prothorax twice as long as head; sides strongly arcuate; set with numerous short, slightly curved spines, a group of three or four at each angle being more conspicuous than at the middle of the sides; irregular transverse markings dorsally. Mesothorax slightly wider than metathorax; transversely striated. Metathorax with concentric polygonal markings. Fore-wings reaching nearly to or slightly beyond tip of abdomen; brown, paler at base; costal margin decidedly concave, bearing about 28 stout spines which are longer toward the tip, and among which are numerous slender hairs; fore vein with about 24, hind vein with 16 or more short spines placed nearly equidistant from each other throughout; surface of wings covered with minute spines. Legs concolorous with body, except tarsi and distal part of fore tibiae which are yellow; not prominently spinose, but bearing numerous irregular ridges which appear almost like the coarse reticulum on the sides of the thorax and abdomen.

Abdomen widest about the fourth segment. Each segment from the second to the tenth bears dorsally two distinct spines, which are close together in front, gradually diverge to the ninth segment, but are close together on the tenth; a number of smaller spines sometimes fall roughly into two rows along the sides, and into one row ventrally. Posterior borders of segments two to eight prolonged into numerous short spines. Tenth segment split in its median dorsal line through its distal third. Spines around tip of abdomen not very prominent.

*Male*.—General color sometimes much paler than that of the female. Length of body .72 mm.; width of prothorax .18 mm.; width of mesothorax .21 mm.; width of abdomen .16 mm. Length of antennal segments 10  $\mu$ , 23  $\mu$ , 37  $\mu$ , 33  $\mu$ , 21  $\mu$ , 21  $\mu$ , 15  $\mu$ , 12  $\mu$ , 14  $\mu$ .

*Wings are of full length, extending beyond tip of abdomen.*

Tip of abdomen bluntly conical. Ventral sides of abdominal segments three to eight with an oblong pale area transversely placed.

Described from numerous females and four males taken July 14, 1908, on the outside of the catkins of the willow, *Salix fluviatilis*. The italicized characters distinguish this species from its congener *H. arisaemae* Hood.

**SCIRTOTHRIPS** n. gen. (Figs. 2-4).

(σκιπρώ, to leap; θράψ, a wood-worm.)

Ocelli present. *Head is shorter than broad and shorter than prothorax.* Antennae eight-segmented. Maxillary palpi three-segmented. Legs bearing only medium to weak spines. Wings present, with rugose veins bearing weak spines. *One spine of moderate length is borne by each posterior angle of the prothorax.* None of the body spines stout.

*Species of this genus have the power of springing.*

This genus reminds one at once of the genus *Anaphothrips* Uzel, but can be at once distinguished from that genus by the above italicized characters. It can be further distinguished from our member of that genus, *A. striatus* (Osborn), by the fact that the sixth antennal segment is not divided by an oblique groove. By proposing the name *Scirtothrips*, I do not wish to imply that the leaping of this insect is remarkable for its vigor; on the contrary, its leap is weaker than that of many other springing species. I do wish, however, to emphasize the fact that it does spring, for it is this character, I believe, which most surely marks the new species as belonging to a genus distinct from *Anaphothrips*. It might be fairly doubted whether two insects so similar in general form and in type of wing should be placed in separate genera merely because the original description of the one genus precluded a short head and a given spine on the prothorax; but when these structural differences are accompanied by a difference of habit, there is good reason for the erection of a new genus, particularly since the habits of thrips, at least in the matter of springing, are more constant than many of the structural characters commonly used to distinguish species.

**Scirtothrips ruthveni** n. sp. (Figs. 2-4).

*Female*.—General color of body lemon-yellow, without any shading. Length of body .85 mm.; width of prothorax .15 mm.; width of mesothorax .21 mm.; width of abdomen .21 mm. Length of antennal segments 15  $\mu$ , 36  $\mu$ , 41  $\mu$ , 36  $\mu$ , 33  $\mu$ , 39  $\mu$ , 6  $\mu$ , 10  $\mu$ .

Head 1.8 times as broad as long. Frons emarginate between antennae. Spines few and weak, those most readily visible being one at each side of the head just behind the eye; others apparently not constant. Eyes black, slightly protruding, sparsely pilose. Ocelli clustered, with red-

dish orange crescents. Mouth cone reaching nearly to posterior edge of prothorax, moderately sharp. Maxillary palpi three-segmented. Antennae eight-segmented, 2.8 times as long as exposed part of head. First segment cylindrical, second barrel-shaped; third and fourth more or less fusiform; fifth and sixth subcylindrical; seventh cylindrical; eighth conical. Third segment distinctly, fourth and fifth slightly, stalked.

Bifurcate sense cones on dorsal side of third segment and ventral side of fourth. Spines on antennae distinct, but not prominent. Color uniform yellow.

Prothorax 1.8 times as long, and 1.2 times as wide, as head. Sides considerably arched. Two or three short, curved spines near each anterior angle, one long but weak spine at each posterior angle. Other spines wanting or inconspicuous. Mesothorax with rounded anterior angles. Wings concolorous with body; costal and both interior veins promi-

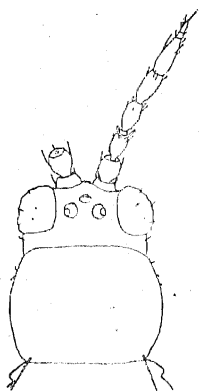


Fig. 2.—*Scirtothrips ruthveni* n. gen. and n. sp.—Head, prothorax and antenna of female.



Fig. 3.—*Scirtothrips ruthveni* n. gen. and n. sp.—Right fore-wing of female.

nent, and rugose, at least in basal part; costa set with about 23 spines, which increase in length to the tip; fore vein with 10 or 11 spines which are closely set but at unequal distances in the basal half, far apart distally; hind vein with three spines not constantly placed. Entire surface of wing, including veins, covered with minute spines arranged in longitudinal rows which, in the basal half of the wing, are ten to twelve in number. Legs not stout, concolorous with body.

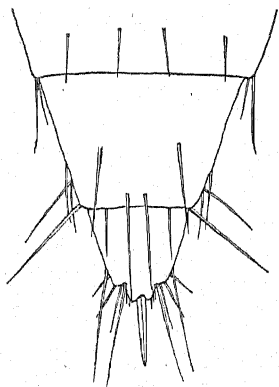


Fig. 4.—*Scirtothrips ruthveni* n. gen. and n. sp.—Tip of abdomen of female, dorsal view.

Abdomen widest about fourth or fifth segment, uniform in color. Ninth segment nearly twice as long as tenth. Spines inconspicuous, except those on segments nine and ten, and these are weaker than frequently found among Thripidae. Ovipositor long, extending considerably beyond tip of abdomen.

Described from seven females taken in the terminal leaf clusters of dogwood, *Cornus stolonifera*, on

July 19, 1908. I take pleasure in naming this species for Dr. A. G. Ruthven, Chief Field Naturalist of the Michigan Biological Survey, in recognition of his aid and kindly interest in all my work.

Genus **ANAPHOTHRIPS** Uzel.

**Anaphothrips striatus** (Osborn).

*Male*.—Newly discovered.\* Agrees well with the female, except that it is smaller, and the abdomen is more slender and bluntly rounded at the tip. Length of body .83 mm.; width of prothorax .14 mm.; width of prothorax .14 mm.; width of mesothorax .16 mm.; width of abdomen .16 mm. All tarsi, as in female, unarmed.

Two specimens taken with numerous females on sand-binder, *Ammophila arenaria*, July 7, 1908. This species has long been supposed to be parthenogenetic in nature, and was bred parthenogenetically for several generations by Hinds. It may be doubted whether these sporadic males are ever functional.

Genus **BALIOTHRIPS** Haliday.

**Baliothrips basalis** n. sp. (Fig. 5).

*Female*.—General color of body brown, appearing to the unaided eye, by reflected light, nearly black, with a transverse white band across the pterothorax. Length of body 1.12 mm.; width of prothorax .20 mm.; width of mesothorax .26 mm.; width of abdomen .26 mm. Length of antennal segments 15  $\mu$ , 36  $\mu$ , 43  $\mu$ , 40  $\mu$ , 39  $\mu$ , 47  $\mu$ , 21  $\mu$ .

Head slightly broader than long, cheeks slightly diverging behind the eyes; posterior portion transversely striated. Frons sharply emarginate between antennae. One short postocular spine well toward each side of

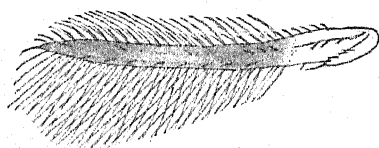


Fig. 5.—*Baliothrips basalis* n. sp.—Left fore-wing of female.

the head; four, sometimes three, other spines in a transverse row on each side nearer the median line, the innermost one being longest and standing directly behind the ocellus of that side. A spine on either side of the anterior ocellus, nearly between it

and the two posterior ocelli, and a longer spine near inner margin of each eye in front. Eyes rather prominent, black, with yellow margins. Ocelli reddish orange, rather close together, posterior ones not contiguous with eyes. Mouth cone reaching slightly past middle of prothorax; maxillary palpi two-segmented. Antennae seven-segmented, 2.2 times as long as head. First segment cylindrical; second barrel-shaped; third to fifth vase-like; sixth broadest near base; seventh slightly tapering.

\* I have found but one reference to a supposed male of *Anaphothrips striatus*, namely, that of L. R. Cary, Bull. 83, Maine Agr. Exp. Station, June, 1902. Cary's figures plainly show that his male was not of this species.

First and second and fifth to seventh segments concolorous with body ; third yellow ; fourth brownish yellow. Bifurcate sense cone near tip of fourth segment on ventral side is especially noticeable.

Prothorax 1.25 times as long and 1.3 times as wide as head. Two prominent spines at each posterior angle ; two much shorter, curved, anteriorly directed ones near each anterior angle ; and several other short, curved ones along the sides. Mesothorax with irregular transverse striations. Metathorax with sigmoid longitudinal markings which branch and anastomose. *Pterothorax is not distinctly lighter in color than the rest of the body.* Fore-wings reaching about to tip of abdomen ; brown like the body, except a broad area at the base which is white, forming in the uncleaned insect a conspicuous transverse white band ; third quarter of wing often *slightly* paler than second and fourth quarters ; *there is no light fleck near the tip of the wing.* Costal margin set with about thirty rather stout spines which increase in length toward the tip ; fore vein with eight to ten weak spines, of which five or six are on the basal two-fifths, the remaining three or four widely separated ; hind vein with seven to nine spines on distal two-thirds of wing, slightly farther apart near tip of wing. Surface of wings covered with minute spines arranged in about twenty-one rows. Legs concolorous with body, except tarsi and distal portions of all tibiae, and sometimes proximal end of femora yellow ; a row of short stout spines on inner side of hind tibiae, other spines irregularly placed.

Abdomen with long spines on last two segments ; shorter spines along the sides ; spines on ventral side weak and arranged roughly in a transverse row on each segment ; those on dorsal side inconspicuous and irregularly arranged. Tenth segment split above for at least part of its length, sometimes wholly.

*Male.*—Length of body .87 mm. ; width of prothorax .17 mm. ; width of mesothorax .23 mm. ; width of abdomen .17 mm. Length of antennal segments 15  $\mu$ , 30  $\mu$ , 38  $\mu$ , 39  $\mu$ , 33  $\mu$ , 46  $\mu$ , 21  $\mu$ .

*Wings are present*, with pale area on third quarter distinct, but not as conspicuous as on basal quarter. Legs with bases of femora and most of tibiae yellow, fore femur lightest of the three.

Abdomen bluntly conical. Oblong pale area on ventral side of each of abdominal segments three to seven.

Described from numerous females and four males taken on upper and under sides of leaves of tall millet grass, *Milium effusum*, August 5 to 13, 1908. The italicized characters distinguish this species from *B. dispar* Haliday. I have been compelled to disregard Haliday's inclusion of rudimentary wings in the males as a generic character. His wingless males, moreover, may belong to definite seasons only, as seems often to be the case with other species.



## Suborder TUBULIFERA Haliday.

## Family PHLOEOTHIRIPIDAE Uzel.

Genus **TRICHOTHRIPS** Uzel.**Trichothrips tridentatus** n. sp. (Fig. 6).

*Female*.—General color of body brown or light brown; much red hypodermal pigmentation; except on head and legs. Length of body 1.7 mm.; width of prothorax .24 mm.; width of mesothorax .31 mm.; width of abdomen .38 mm.; length of antennal segments 16  $\mu$ , 47  $\mu$ , 56  $\mu$ , 52  $\mu$ , 52  $\mu$ , 48  $\mu$ , 37  $\mu$ , 26  $\mu$ .

Head about as broad as long. Cheeks nearly parallel, slightly rough, with several minute spines. Distinct postocular spines on each side. Eyes small, continuous in outline with cheeks and vertex; deep red with yellow margins. Ocelli present, obscured by hypodermal pigmentation.

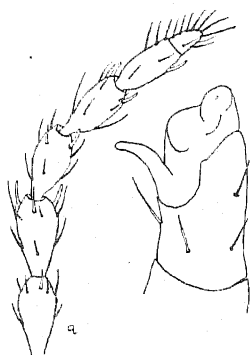


Fig. 6.—*Trichothrips tridentatus* n. sp.—Antenna beyond second segment, and fore tarsus of female.

Mouth cone long and pointed, extending slightly beyond posterior edge of prosternum; maxillary palpi two-segmented, second segment four or five times as long as first; labial palpi with four spines at tip. Antennae twice as long as head. First segment cylindrical; second barrel-shaped, slightly narrower at base; third to sixth urn-shaped, distinctly stalked; seventh slightly stalked, forming broadly with the eighth, which is roundly conical. Segments all concolorous with body, except second and the base and top of the third, which are yellowish; the second may be clouded basally. A row of six spines on eighth segment continuous with three more on distal part of seventh. One or two simple sense cones on the third to the seventh segments inclusive.

Prothorax about as long, and (exclusive of fore coxae) 1.5 times as wide, as head. Sides strongly divergent in front half; nearly parallel, slightly concave, in posterior half. One spine at each posterior angle. Meso- and metathorax of nearly equal width. Wings present, reaching to sixth or seventh segment of abdomen; sides of fore-wing parallel, strong fringe all around, double for about ten hairs just short of tip on posterior margin; colorless throughout. Legs without hypodermal pigmentation, otherwise concolorous with body, except that the tarsi are light brown, and the tips of all femora are yellow beneath; fore femora slightly enlarged; all tarsi with a small curved tooth; fore coxae with one prominent spine.

Abdomen with sides nearly parallel to seventh segment, thence rounding off to base of tube. Spines distinct but not conspicuous. Tube slender as compared with abdomen; length .14 mm.; breadth of middle .05 mm.

Described from two females taken under the scales of the bark of white oak, *Quercus alba*, August 25, 1908. Readily distinguished from *T. dens* Moulton by the absence of hypodermal pigmentation in head and legs.

***Trichothrips brevicornalis* n. sp. (Fig. 7).**

*Female*.—General color of body black, nearly opaque even with strong light. Length of body 1.71 mm.; width of prothorax .30 mm.; width of mesothorax .36 mm.; width of abdomen .50 mm. Length of antennal segments 41  $\mu$ , 52  $\mu$ , 48  $\mu$ , 49  $\mu$ , 46  $\mu$ , 41  $\mu$ , 41  $\mu$ , 37  $\mu$ .

Head very slightly longer than broad; cheeks somewhat arched behind eyes, rough, some of the prominences bearing anteriorly directed spines; surface reticulate, the cells of the reticulum having their long axis transversely placed (visible only in cleared specimens, as are many of the characters mentioned below). Frons roundly emarginate between antennae. Postocular bristles rather prominent, situated over one-third the length of the cheek behind the eyes. Eyes black, with yellowish brown margins. Ocelli present; posterior ones almost contiguous with eyes, and located at about the middle of the latter antero-posteriorly, with a small spine behind each; anterior one almost completely obscured by pigment. Mouth cone blunt and short, reaching but slightly past middle of prosternum; maxillary palpi two-segmented, the second segment four or five times as long as the first. Antennae 8-segmented, 1.6 times as long as head. First segment cylindrical, second barrel-shaped, third to seventh vase-shaped, distinctly but not narrowly stalked; eighth more or less fusiform, with its widest point two-fifths of its length from the base. First segment black; second becoming brown toward tip; third yellowish brown, fourth and fifth becoming gradually darker; sixth to eighth dark brown, except base of the sixth which is paler. The second segment has a circular pale spot above near its tip; the fourth bears on each side distally a short but quite stout simple sense cone; the sense cones on the fifth are less conspicuous; the eighth bears on its dorsal side a row of six spines (exclusive of the apical one) which with three similar spines on the distal third of the seventh segment form a sort of comb.

Prothorax .83 times as long and 1.5 times as broad as head. One moderately long spine at each posterior angle, a short one at each anterior angle; all blunt, those at the posterior angles being, like most of

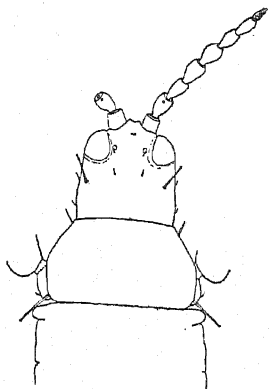


Fig. 7.—*Trichothrips brevicornalis* n. sp.—Head, prothorax, antenna and part of pterothorax.

those on the abdomen, slightly enlarged at the tip. Mesothorax with rather prominent anterior angles, which are nearly right-angled. Wings wanting. Legs short, dark brown to black, except the tarsi which are brown; all tarsi armed with fairly prominent curved teeth. Spines on legs short and comparatively few in number, being most numerous on convex sides of femora.

Abdomen stout, broadly rounding from seventh segment to the tube. The third to eighth segments inclusive bear five or six spines on each side, forming a row extending well on to both dorsal and ventral surfaces. Nearly all abdominal spines enlarged at tip, except on the tube and some on the ninth segment. Color black, except tip of tube which is brown.

Described from five females taken among the leaves of the pine-cone gall on the willow, *Salix fluviatilis*, July 14, 1908. The salient features of this species, one or another of which readily distinguishes it from the majority of the other members of the genus, are the absence of wings, the color of the antennae, the paucity of conspicuous spines on the prothorax, and the fact that all the tarsi are armed.

Genus **ALLOTHRIPS** Hood (1908).

***Allothrips megacephalus* Hood.**

*Male*.—Newly discovered. Agrees well with the female, except in size, shape of abdomen, and in the fact that the fore tarsi are armed with a small curved tooth. Length of body .81 mm.; width of prothorax .21 mm.; width of mesothorax .21 mm.; width of abdomen .25 mm. Abdomen tapering gradually from third or fourth segment to the tube, not broadly rounded as in the female.

A single specimen taken with three females under the scales of bark of black ash, *Fraxinus nigra*, August 24, 1908. Both antennae lost beyond second segment. The definition of the genus will have to be emended by omitting the character "fore tarsi unarmed."

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## On Thysanoptera.

By H. J. FRANKLIN, PH.D.

Of the Minnesota Agricultural Experiment Station, St. Anthony Park, Minn.

### **ALEURODOTHRIPS** n. gen.

This name "White fly thrips" has reference to the fact that the type species is predaceous on the white flies of orange trees in Florida.

Head about as long as broad, with parallel cheeks; eyes

rather small and vertex between them elevated; mouth cone reaching nearly to the hind edge of the prosternum, the labrum blunt. Prothorax about two-thirds as long as the head, each angle bearing a knobbed spine. Fore femora of the male greatly swollen, each over one-half as wide as the head and

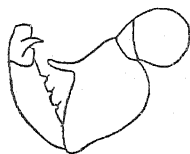


Fig. 1.—Left foreleg of *A. fasciapennis*, male,  $\times 194$ .

bearing somewhat proximal of the middle on its inner (anterior) side a long, prominent, slightly curved projection. Each fore tibia of the male with three noticeable denticles or tubercles on its inner side. Fore tarsi of the female unarmed, those of the male with a strong tooth. Wings present in both sexes. Abdomen with a number of

prominent knobbed spines on the sides, and with some of the dorsal segments bearing a pair of double curved spines.

This genus is erected for *Cryptothrips fasciapennis* Franklin (Proc. U. S. N. M., vol. xxxiii, p. 727, 1908, Pl. LXIV, figs. 12, 13). The species was originally placed in the genus *Cryptothrips* with considerable doubt, but, as I had only a single specimen to describe from, and that in rather poor condition, I decided it was best not to erect a new genus for it at that time. The male, however, has such remarkably distinct characters that the species cannot be considered to be even closely related, either to *Cryptothrips* or any other genus heretofore described.

I have carefully compared many females from Florida with the type specimen and have been unable to discover enough difference to even consider the Florida specimens as belonging to a distinct variety. The original description of the female should be amended and added to as follows:

Length 1.04-1.21 mm. (the type specimen was stretched to the point of tearing in mounting); width of head .169-.201 mm.; width of mesothorax .258-.33 mm.; greatest width of abdomen .34-.37 mm. General color yellowish brown (the type is slightly darker than the Florida specimens—probably because of its age) with the sixth abdominal segment dark brown—strikingly darker than the rest of the body, the head and prothorax light brown, with a slight tinge of red, darker than the rest of the body, except the sixth segment of the abdomen. By reflected light the hypodermal pigmentation with which the body is irregularly mottled is seen to be whitish or cream color. The last four segments of the abdo-

men, as seen by transmitted light, clear honey yellow. Femora and tibiae of fore legs usually shaded slightly with brownish yellow; the middle and hind legs nearly transparent, except the distal ends of the femora, these being rather strongly stained with light brown. The hind wings are colored much like the fore wings, though with the general color not as dark, and with the basal transparent cross-band much wider (in fact, the basal two-fifths of the wing is almost entirely transparent). The abdomen, when normally retracted, rather chunky and ovate in form.

I have deposited two females in the collection of the U. S. National Museum, one in the collection of the Minnesota Experiment Station, and one besides the type in the collection of the Massachusetts Agricultural College.

*Male*.—Length .95-1.03 mm.; width of head .15-.16 mm.; width of mesothorax .217-.258 mm. Colored in general much like the female, but with the sixth abdominal segment less strikingly darker than the rest

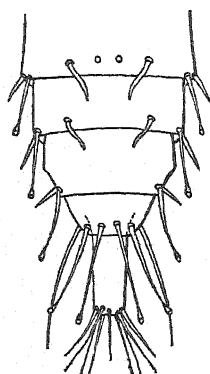


Fig. 2.—Dorsal view of end of abdomen of male, x 194.

of the body. The head very slightly narrower in front than behind. The abdomen widest at the base, being in that portion of about the same width as the metathorax, and narrowing rapidly toward the tube so as to be triangular in outline as viewed from above or below; the hind angles of most of the abdominal segments square and prominent and bearing one or two stout spines each. The very large fore femora give the male a striking appearance. The prothorax of the male is about four-fifths as long as the head, and the head is often so retracted into the prothorax that they seem to be of about equal length.

Described from three males (the co-types of this sex), one of which is deposited in each of the three following collections: United States National Museum, Massachusetts Agricultural College and Minnesota Agricultural Experiment Station.

I wish here to acknowledge my indebtedness to Dr. E. A. Back, from whom I received the specimens on which the above descriptions are based. This species was first observed to be associated with the citrus white fly (*A. citris*) by Dr. Morrill in 1906 in connection with the white fly investigation by the Bureau of Entomology of Florida, and has been observed many times in the act of feeding on the larvae, pupae and eggs of this pest fly by both Mr. Morrill and Dr. Bach. They

will make further mention on the habits of this thrips in a forthcoming bulletin of the Bureau of Entomology, U. S. Department of Agriculture.

#### NOTES ON OTHER SPECIES.

September 19, 1908, I found two females and two larvae of *Megalothrips* (?) *spinosus* Hood under the bark of a dead limb of white birch at St. Anthony Park, St. Paul. The two larvae were both considerably less than half grown and they were purplish red in color. On October 15, 1908, I also discovered a single female of *Trichothrips buffae* Hood at St. Anthony Park, under plum bark.

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### North American Heteroptera.

By E. P. VAN DUZEE, Buffalo, New York.

These descriptions may be considered as a second installment of a paper by the same title published in the December, 1906, number of the ENT. NEWS, xvii, pp. 384-391. They represent new species which have come into my hands from various sources.

#### **Thyreocoris montanus** n. sp.

Size and general aspect of *lateralis*, but with a broader pale border to the corium. Pronotum more convex, with the lateral margins more rounded, thus giving the insect less of the appearance of being triangularly narrowed anteriorly which we find in the allied species; these margins entire and rounded below the humeri, not longitudinally impressed as in that species. Margins of the cheeks slightly sinuated, the tylus scarcely attaining the apex of the cheeks. In *lateralis* the tylus is distinctly longer than the cheeks, giving the head a more pointed appearance; whole surface closely punctured. Antennae pale, becoming dusky at apex. Legs piceous brown. Elytra: coriaceous portion white, with a black vitta which does not attain the tip. This black vitta is narrower than in *lateralis*, and at base is deflected along the inner margin; when the elytra are closed it conforms to the form of the scutellum leaving the white margin enlarged within and concentric with this scutellar margin which is not the case in *lateralis*. Length  $3\frac{1}{2}$ -4 mm.

Described from numerous examples representing the following localities: Ogden, Utah, on the Wasatch Mountains (type locality); Provo and Parowan, Utah, Wickham; Wenatche, Washington, Wickham; Riverside, California, Cornell Univ. collection; and Klikitat V., Wyoming. Those from Ogden I

swept from a grassy opening in Williams Canon at an altitude of about 7000 feet.

This is the species I identified as *lateralis* Fabr. in my paper on the North American Pentatomidae in Trans. Amer. Ent. Soc., xxx, p. 8, 1904, where I have given more fully the differential characters separating this species from *lateralis*.

During the four years which have elapsed since the publication of the paper referred to above I have examined carefully a long series of both this species and *lateralis* Fabr. from most all parts of the United States and have as a consequence found myself obliged to change my views regarding the identity of these forms. I am convinced that the species I described as *gilletti* in 1904 is the true *lateralis* Fabr., and that it is distributed throughout the eastern United States from Massachusetts to southern Florida and southwestwardly to Texas and Mexico. My *montanus* seems to be confined entirely to the Rocky Mountain region and the far northwest. From the description of Fabricius alone it would be difficult to decide which of these species he intended to describe, but their geographical distribution would seem to preclude my former determination.

***Sephina grayi* n. sp.**

Allied to *dorsalis* and *gundlachi*, but nearer to the former in most of its characters. Color testaceous yellow, perhaps inclined to orange in life, marked with black. Head black above and before, with a fulvous dot between the antennae and an oblique yellow line interior to each eye connecting anteriorly with the yellow inferior surface. Antennae black, yellowish pubescent; first, second and fourth joints subequal in length, third shorter. Rostrum black, attaining the anterior line of the intermediate coxae. Pronotum with a large semicircular basal spot, and the humeral angles minutely black. Scutellum, elytral membrane and legs entirely, including the coxae, black. Propleura with a round black spot placed anteriorly; meso- and metapleura with a large lateral black spot and a smaller one between the coxae, those on the mesopleura connected anteriorly. Connexivum alternated with black above and below. Venter marked with a broad black vitta on either side behind the first segment, these vittae deeply eroded within on the hind margin of each segment, this yellow margin narrowest on the fourth and fifth segments where the included median yellow vitta is narrow; genital segment mostly black. Valves of the female of equal length; apex of the male genital segment broadly and regularly arcuated. Length 16-18 mm.; width across the humeri 6 mm.

Described from two male and two female examples taken by Mr. George Gray, the collector for the Wood's Holl Marine Biological Laboratory, in Florida, and kindly sent to me for study by Prof. E. B. Wilson of Columbia University. This large showy insect seems to be strictly intermediate between *dorsalis* White and *gundlachi* Guer. From the former it differs most conspicuously by the alternated connexivum, and from the latter by the unicolorous corium. In some of the examples the apex of the corium is distinctly infuscated, but this may be owing to immaturity.

***Oncopeltus spectabilis* n. sp.**

Closely allied to *gutta* H. S., but with the yellow markings of that species replaced by orange-red. Antennae, rostrum, legs, mesosternum, mesopleura anteriorly, a longitudinal vitta on the intermediate acetabulae, sides and hind margin of the metapleura, apex of the venter, broad hind margin and narrow edges and median line of the posterior lobe of the pronotum, base and median vitta of the scutellum, a transverse vitta on the corium broader on the costa, and the membrane black. Disk of the membrane with a transverse white mark. Head scarlet; tylus black; eyes and ocelli fuscous. Fourth and fifth ventral segments scarlet, with a transverse blackish intermediate vitta. Antennae distinctly pilose; basal joint surpassing the tip of the tylus by at least one-half its length; second longest; fourth scarcely shorter; third rather more than twice the length of the first. Length 10 mm.

Described from one male taken by me at Kingston, Jamaica, and recorded as *O. gutta* in my paper on the Jamaican Hemiptera. At the time of publishing that paper I had not seen the real *gutta* and did not like to describe this form as new on color characters alone. It is quite distinct from *gutta* in its more hairy surface, the longer basal joint of the antennae, the deep orange instead of yellow color, the scarlet head, the narrower black vitta on the elytra and the absence of a black median spot on the anterior lobe of the pronotum. The extent of the black markings may be variable in this species as it is known to be in *gutta*.

***Ischnodemus slossoni* n. sp.**

Closely resembling *falicus*, but with the rostrum longer and the antennae pale at base. Head less strongly punctured than in *falicus*; deep black, scarcely sericeo-pubescent. Antennae rather slender, the apical joint thicker than in the allied species; pale rufo-testaceous at base; third



beyond the middle and the fourth black. Rostrum pale, reaching almost to the middle of the mesosternum; inner surface of the basal joint blackish, extreme tip infuscated. Pronotum oblong, a little widened posteriorly; abruptly arcuately narrowed before; behind the middle with a broad strongly punctured and slightly constricted band behind which the base is almost impunctate and pale rufo-testaceous; surface anteriorly very obscurely punctured, without a discal fova. Legs pale rufo-testaceous; the anterior femora a little darker at base. Scutellum black, distinctly carinate at apex. Elytra testaceous white, an obscure commissural line, the apical margin and two longitudinal streaks, fuscous; nervures of the membrane concolorous at base, strong and blackish posteriorly. Abdomen blackish castaneous; fifth ventral segment forming a broadly rounded sinus, the base of which just passes under the apex of the fourth segment. Length  $4\frac{1}{2}$  mm.

Described from two female examples taken at Jacksonville, Florida, by Mrs. Annie Trumbull Slosson, to whom it gives me pleasure to dedicate this interesting addition to our southern fauna. One of these specimens is macropterous and the elytra attain the apex of the fifth tergal segment. The other is brachypterous, and in this they reach only to the middle of the second segment. I took another specimen at Raleigh, North Carolina, on April 17, 1908.

***Ischnodemus conicus* n. sp.**

Allied to *Sallei*. Black; antennae toward its base, narrow hind margin of the pronotum, elytra, osteolar orifices, legs and rostrum testaceous or rufo-testaceous; slender margins of the connexivum pale testaceous. Elytra more or less clouded with fuscous at least along the claval suture and on the apex of the corium; membrane somewhat infuscated, with four strong straight nervures. Antennae: first joint thick, oval, extending for fully half its length beyond the tylus; second and fourth subequal; third scarcely shorter; apical half of the third and fourth blackish. Rostrum reaching to about the middle of the mesosternum. Acetabulae and hind edge of the metasternum conspicuously rufo-testaceous like the orifices and legs. Carinate tip of the scutellum pale. Elytra not completely developed in these specimens, passing the middle of the fourth dorsal segment of the abdomen. Venter clothed with a grey pubescence but showing a slender black line connecting the stigmata, and a black point on each segment below this; all the segments very narrowly edged with pale. Length 7-9 mm.

Described from one pair taken at Galveston, Texas, in May by the late Prof. F. H. Snow, to whom I am indebted for many interesting insects from the southwest.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., MAY, 1909.

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Now that the collecting season is about to begin, the collector is probably contemplating the work for the season. He is cherishing the desire to add to his collection certain desiderata. How much better it would be if he contemplated working out and publishing the life-history or habits of some species. Collecting is valuable work in a way, but the acquisition of knowledge for the benefit of all is the kind of work to be desired. We are often prevented from doing the kind of work for which we are best fitted, but we should always make an effort to do that which is for the best interest of all concerned. We should gradually drift away from the old idea of gathering together a lot of species and ticking them off in a list. Some study of habits would be far more valuable and in the end far more interesting. What we don't know about insects is something startling, and we should endeavor to cut down the great disproportion between the known and the unknown.

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FOR THE last two or three years I have devoted most of my time to the *Phytophaga*, especially Mexico and South America. I have collected together a considerable material, and have been struck with the dearth of information in the way of naming foreign specimens to be had in the United States. This has gradually led me to form the determination to specialize on this group, and with this end in view I purchased most of the library of the late Mr. Jacoby, and have also bought the *Phytophaga* of the Van de Poll collection, which includes what is known as the first Jacoby collection, *i. e.* the one formed by him up to and including his work on the "Biologia." This collection embraces about 6000 named

species, including 2000 types and co-types, and is, I believe, the most important collection of that family ever brought to this country, and I hope to make it the nucleus of a larger collection, so that all our foreign material will not have to go to Europe for names. I thought the acquisition of this collection might be of sufficient interest to warrant a little notice in the News.

I suppose my 50 page paper on *Pachybrachys* would hardly interest the News, it is a resumé of all the known species of United States and descriptions of new forms.—FRED. C. BOWDITCH.

MR. EDWARD P. VAN DUZEE, librarian of the Grosvenor Library, Buffalo, N. Y., has recently published an interesting paper in the Bulletin of the Buffalo Society of Natural Sciences, ix, pp. 149-230, entitled "Observations on some Hemiptera taken in Florida in the Spring of 1908." Two new genera and 29 new species are described.

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## Doings of Societies.

At a regular meeting of the Feldman Collecting Social held, March 17, 1909, at 1523 South 13th Street, Philadelphia, twelve members were present. President Harbeck in the chair.

The members had a discussion on the Pennsylvania species of *Cychnus*, of which Mr. Wenzel said there were six species and one variety: *viduus*, *elevatus*, *ridingsii*, *andrewsii*, *stenostomus*, var. *lecontii*, and *canadensis*.

Mr. Laurent spoke on various lists of Lepidoptera, and said when names have been changed and species placed under different genera they were very hard to find; thinks A. O. U. have the ideal way of arranging same. In the new lists under each species they give the number in the previous lists where these can be found. This lead to a long discussion on lists of different orders: Coleoptera, Diptera, etc., and way of arranging genera and species.

Mr. Harbeck said in some cases where two species are almost identical they have a different way of acting when alive, and if some of the entomologists who do descriptive work would do more field work it would not leave them in any doubt as to where to place them.

Mr. Daecke exhibited a specimen from State collection of a rare dusky form of *Colias philodice* Godt. found near Harrisburg.

Mr. Kaeber exhibited a small copper oven for drying insects.

GEO. M. GREENE, *Secretary*.

## The James Fletcher Memorial Fund.

The Ottawa Field-Naturalists' Club, of which Dr. James Fletcher was one of the founders, have thought that his life work was of such a national character that a permanent tribute to his memory should be made. Such a memorial would not only serve to commemorate for all time the good work done by Dr. Fletcher, but would also act as a stimulus to future generations in the study of the fauna and flora of Canada.

Several suggestions have been made as to the form the memorial should take, namely :

- (a) A fountain at the Central Experimental Farm.
- (b) A statue to be placed in the grounds of the new Natural History Museum.
- (c) A bust or portrait to be placed in that building, or at the Central Experiment Farm.
- (d) To found a bursary at some Canadian University.

Of necessity no decision can be reached until it is known, approximately at least, what amount of money can be raised.

Signed on behalf of the Committee,

E. R. CAMERON, *Chairman*,

ARTHUR GIBSON, *Sec.-Treas.*,

*Central Experimental Farm, Ottawa, Can.*

Dr. Fletcher was an honor and credit to Entomology in America, and we sincerely hope that a generous response may come from all America to the appeal of the Committee for funds for this worthy object. Men of note in other branches of science are frequently honored in this way, and entomologists should be proud of the opportunity to so honor one of their fellows.

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A meeting of the American Entomological Society was held on February 15, 1909, to commemorate the fiftieth anniversary of the founding of the Society. Dr. Philip P. Calvert, president, in the chair. Members president: Calvert, Cresson, E. T., Cresson, E. T., Jr., Cresson, G. B., H. Smith, Castle, Liebeck, Skinner, Welles, Wenzel, and Laurent. Associates of the En-

tomological Section of the Academy of Natural Sciences of Philadelphia: Harvey, Greene, Rehn, Daecke, Boerner, Ilg, Coxey, Haimbach, Viereck, Matthews and Cole. Visitors: Dr. Stevens of Plymouth, Mass., Charles Morris, G. Warder Cresson, H. A. Wenzel, C. T. Greene, Theo. H. Schmitz and William Beutenmüller of the American Museum of Natural History New York.

The minutes of the first and last meeting were read. Mr. E. T. Cresson read a very interesting history of the Society, and then moved that a committee be appointed to bring the history up to date. The motion was carried, and the president appointed Messrs. Henry C. McCook, B. H. Smith and Henry Skinner. A portrait of Mr. E. T. Cresson was presented and hung in the Entomological Rooms. The vice-president, Mr. Wenzel, being called to the chair, the president, Dr. Calvert, offered the following resolution, which was seconded and unanimously carried:

The American Entomological Society, assembled in meeting February 15, 1909, to commemorate the fiftieth anniversary of the day on which were sent out invitations looking to the formation of this Society, hereby records its sense of gratitude for that measure of age, position and success which it has attained. It recognizes that this attainment has been due to the unselfish labors of many members, both past and present, among them Bland, Blake, Feldman, LeConte, McAllister, Meichel, Newman, Ridings, Wilson, Wilt, Horn, McCook, Angus, Bassett, Grote, Skinner, Eckfelt, Knight, Pine.

It especially rejoices in the presence to-night of one of the three founders of the Society, Mr. E. T. Cresson, who from the very first has continuously exerted himself in its interests, serving as treasurer for thirty-five years, as editor of the Proceedings, later Transactions, for thirty-eight years, and who, the early days of the Society's existence, cared for its collections and library and with his own hands set type for its publications, besides composing a long series of entomological memoirs, principally upon the Hymenoptera, which have given to him and to the Society an honorable distinction, both at home and abroad. To many a younger student he has kindly given

his aid, his advice and his example. He has encouraged and furthered the progress of Entomology in the United States far beyond the limits of his home by his activity as author and by his gift of his most important, valuable and extensive collection of Hymenoptera to this Society. Thankful for all his unceasing labors, this Society now places upon its records, in his presence, its deep appreciation of his services and extends to him its best wishes for many additional years of life and happiness in that field of science which he has cultivated so long and so well.

Mr. Beutenmüller said it was difficult to fitly express the thoughts the occasion demanded. He had always looked upon the American Entomological Society as the mother society, and said its work was favorably known to all working entomologists. Letters of regret on their inability to be present at the meeting were received from Dr. L. O. Howard, Dr. Arthur E. Brown, Dr. John B. Smith, Dr. Henry Tucker, Prof. H. A. Surface, Dr. E. P. Felt and the Rev. Dr. C. J. S. Bethune.

Dr. Howard wrote as follows: "I regret my official duties will keep me in Washington. I should much like to be with you, and especially to listen to the history of your Society as read by my old friend Mr. Cresson. Please give him and the other members of the Society my warm greetings and congratulations. By a curious coincidence the Entomological Society of Washington has just (February 11th) celebrated its twenty-fifth anniversary. At present, you see, your Society is just twice as old as ours, but of course this proportion will not last. Some of these days they will both be very old societies and approximately of the same age. It gave me great pleasure to introduce at our twenty-fifth anniversary meeting a resolution of cordial congratulation to the American Entomological Society which was unanimously adopted, and Mr. H. L. Viereck, now connected with this bureau, was requested to present the congratulations of the Entomological Society of Washington by word of mouth, as he will be with you at the meeting. The American Entomological Society has done a magnificent work, and we all hope that it may continue to grow in strength and power."

Dr. Bethune said, "I thank you very much for sending me an invitation to the commemoration of the fiftieth anniversary of the American Entomological Society. I regret very much that it is quite impossible for me to be present on this interesting occasion. I have been connected with the Society as a corresponding member for about forty-five years and have always taken a great interest in it. Please give my congratulations to Mr. Cresson on his having lived to see this jubilee of the Society which he did so much to sustain. I trust that it will grow and prosper, and that there may be similar anniversaries in the far future."

Mr. Viereck said it gave him great pleasure to be the bearer of greetings from the Entomological Society of Washington.

Mr. Daecke said all in Harrisburg were glad of the successful career of the Society.

Mr. H. W. Wenzel spoke of the great advantages of the collector of the present day. He recalled the difficulties under which his grandfather, Henry Feldman, labored. He collected cork along the shore of the Delaware to make lining for his boxes, and these were made out of soap boxes by his own hands, and his pins were needles. Early morning starts and long tramps were parts of collecting, and they worked hard through love of the subject.

Mr. B. H. Smith said it was a cause of regret that he did not know what was going on on February 15, 1859. He spoke of the difficulty of getting books in the early days. The "Practical Entomologist" introduced him to the Entomological Society of Philadelphia and Mr. Cresson. He also spoke in praise of the publications of the Society.

Mr. Welles expressed his pleasure at being present and also spoke in appreciation of the work of the Society and its members.

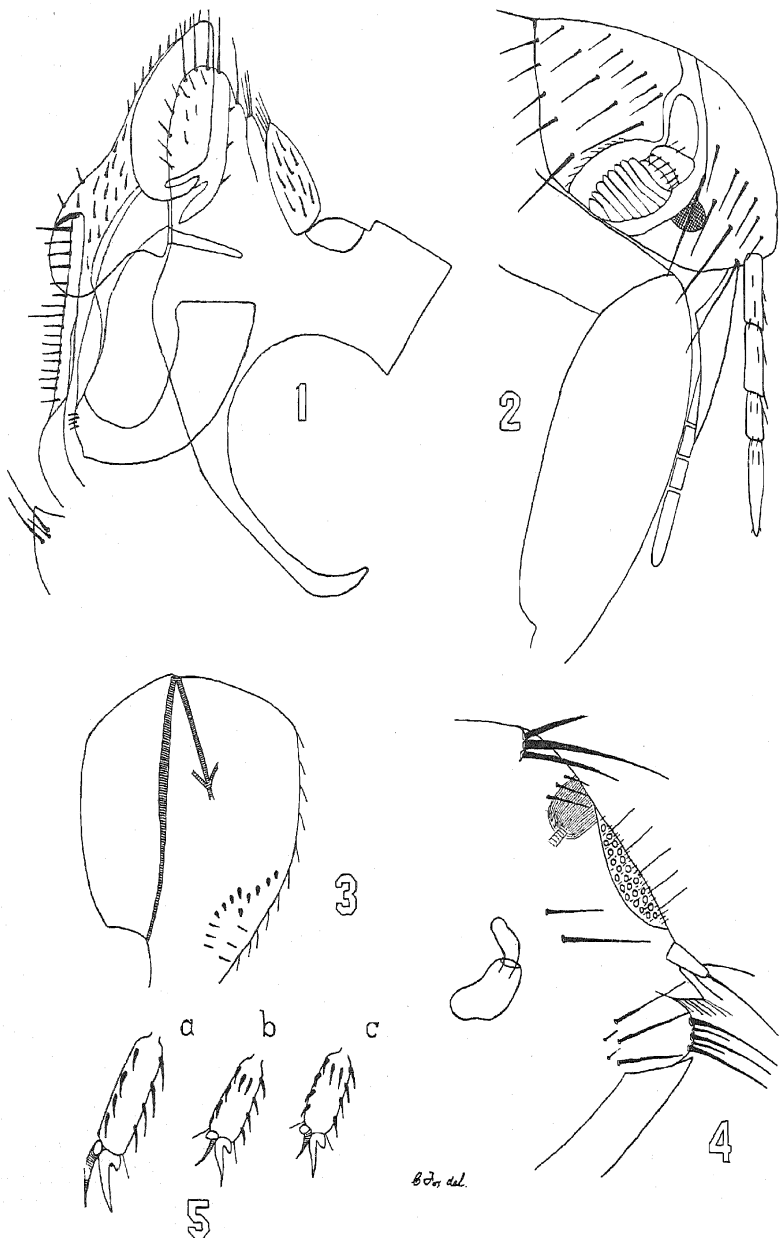
Mr. G. B. Cresson recalled some of the days when the Society was on Rodman Street.

Mr. Rehn quoted Dr. H. T. Fernald as saying that Cresson's keys of the Hymenoptera were the most satisfactory ever published.

HENRY SKINNER, *Secretary*.







ODONTOPSYLLUS WYMANI FOX.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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JUNE, 1909.

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## A New Species of *Odontopsyllus*—a Genus of the *Siphonaptera*.

By PASSED ASSISTANT SURGEON CARROLL FOX, P. H. & M. H.  
S., San Francisco, California.

(Plate X.)

Three male and ten female specimens from the California field mouse (*Microtus californicus*) collected in the Summer of 1908. Mr. Rothschild pronounced this a new species, closely related to *O. telegoni* and *O. charlottensis*.

### ***Odontopsyllus wymani* spec. nov.**

Head evenly rounded from the posterior margin of the occiput to the anterior lower angle of the frons in the female; flattened on top in the male. Frontal notch indistinct. Eye present. Antennal groove reaches to top of head in both sexes. Gena acute at apex. Maxilla triangular. Maxillary palpi almost as long as the labial palpi. Length of joints as follows: 4-4-3-6. Labial palpi five jointed, extends two-thirds the length of the anterior coxa. Antenna three jointed, the last joint being divided into nine pseudo-joints, in which the separations are more distinct on the upper surface. Second joint contains about six hairs, while the first joint contains four or five small ones. The frons contains two rows of bristles, the lower row of four larger ones, the innermost one placed above the eye on the margin of the antennal groove, the third is the smallest and placed above the eye. The upper row consists of six smaller bristles. There is a row of small hairs

along the posterior edge of the antennal groove. The occiput contains three rows of bristles, an anterior row of about five or six small ones, a middle row of about six, somewhat larger and a subapical row of about six. The lowest of these bristles are the longest. The pronotum has one row of about ten bristles with a ctenidium of about fourteen spines. The mesonotum has two rows of bristles, a posterior of about eight larger and an anterior of about sixteen smaller ones. In front of this row there are a few hairs, more or less regularly disposed. The same may be said of the metanotum. The episternum of the metathorax contains two bristles, the sternum one or two larger ones. There are two rows of bristles on the epimerum, an anterior and posterior which contain four bristles each. The lowest in the posterior row is very much the largest. Still posterior to this is a single large bristle. The first tergite contains two rows of bristles, an anterior of ten large and a posterior of more numerous smaller bristles. The next six tergites each contain two rows of bristles, the posterior of about fourteen large, of which the lowest is placed just below the stigma and an anterior of about fourteen smaller ones. On the first tergite there is one tooth, and on the second, two teeth, on the third and fourth, one tooth on each side. The third, fourth, fifth and sixth sternites each contain a single row of about six bristles with two smaller ones just anterior to this row. The seventh sternite in the female contains about eight or ten larger bristles with a few small ones in a row anterior. There are three antipygidial bristles on each side, the middle of which is the longest. The fore coxa is normally bristled, while the fore femur contains two rows of bristles on the outer side of about five bristles each. The mid and hind femur are without bristles on the lateral surface. The hind coxa contains a patch of eight or ten teeth and a few hairs on its inner surface. The fifth tarsal joint of the fore and mid leg contains four lateral spines and a fifth pair between the first pair. The last tarsal joint of the hind leg contains four pairs of lateral spines. The spines on the posterior border of the hind tibia are in pairs while the lateral surface is covered with about eighteen bristles in two rows placed close together. None of the apical bristles of the tarsi are longer than the next preceding joint. Length of tarsal segments:

Hind tarsus .....	12	9	6	3½	6
Mid tarsus .....	6	6	4	3	5
Hind tarsus .....	13	10	7	4	7
Mid tarsus .....	6	5	3	2½	5

Modified Segments: The eighth sternite contains a row of about eight small hairs, while laterally there are two bristles, a large and a small, beneath and in front of the pygidium. Below there is a row of three stout bristles with a few smaller ones while on the apical margin there are also about three large bristles and a few small ones. The

style is long and slender, somewhat longer at the base than at the apex where there is a long hair. There is also one arising from its upper and lower borders.

**Modified Segments:** The eighth sternite is prolonged upwards into a slender process on the ventral edge of which are a number of hairs, giving the appearance of a comb. At the tip there is a hook-like spine. The claspers are broad, the manubrium extending forward as a slender well curved process. The process of the claspers is wide and well rounded at the top, with a row of bristles along its upper and ventral margin, the four upper ones being the largest. Besides this, on its lateral surface, are about six smaller bristles. The finger is leaf-shaped, convex on its posterior margin, its anterior margin being straight, narrower at the tip than at the base with a small pedicle.

Length of female ..... 2.14 mm.

Length of male ..... 2.08 "

Color ..... pale brown

#### EXPLANATION OF PLATE.

Fig. 1.—Claspers of male.

Fig. 2.—Head of female.

Fig. 3.—Inner surface hind coxa.

Fig. 4.—Genitalia of female.

Fig. 5.—(a) Last tarsal article hind leg.

(b) Last tarsal article mid leg.

(c) Last tarsal article fore leg.

### A New *Thomisid*.

BY K. R. COOLIDGE.

#### *Misumessus muniери* sp. n.

Cephalothorax a trifle longer than broad, anteriorly more than half as broad as in the middle, between second and third pair of legs, just as long as tibia or metatarsus I. longer than metatarsus II.; above not very highly arched, in the middle almost the highest, from there to the front only a little inclined, in the back declining obliquely.

Color, grassy-green, eye-space of caput much lighter and palish; median fosse, corselet grooves and cephalic suture darker. A series of three black points in the line of the P. S. E., and also two others, more minute, on median line of caput.

Rear row of eyes but little procurved, almost aligned; fore row strongly recurved. P. M. E. about equal in size to A. M. E., but smaller than P. S. E. or A. S. E., which are also about equal; M. E. of both rows farther apart than S. E.; ocular tubercles strong.

Abdomen subcordate, broadest in the middle, rather pointed before, somewhat depressed; longer than broad.

Ground color rather dirty creamish brown; a narrow, uneven dorsal brownish line border, producing a striking heart-shaped appearance; a number of small median brownish points interior to this. Venter paler, sternum light bluish green, flat subcordate.

Legs and mandibles green, tibia and metatarsus somewhat lighter. All legs moderately slender, armed with numerous long but weak spines; tibia I. with eight spines, metatarsus I. with ten, arranged in series of two each; tibia II. with six spines below, also in pairs. Length, 10 mm.

*Habitat*.—Muir Woods, Marin County, California.

Described from a single specimen, a female, collected by Mr. L. E. Munier of San Francisco, to whom I take pleasure in dedicating this dainty species.

It may prove to be *M. pictilis* Banks, but I am satisfied from a comparison with specimens of that species from the type locality (Palo Alto, Santa Clara County), that it is sufficiently distinct. By the structure of the epigynum it also comes close to *Misumena importuna* Keyserling, described from San Mateo County.

***Thanatus coloradensis* Keyserling.**

This species is evidently well distributed throughout California, particularly in the southern parts. It was originally described from Colorado. It might be called the "hedge spider" in the San Joaquin Valley, as it is everywhere abundant there in such situations. I have taken it at Lindsay, in the station there, Porterville, Bakersfield and also have it from Coalinga (Fresno County). It not only lives on plants, but is also frequently found in the corners of porches, the web being not unlike that of *Pholcus phalangoides* Fuess. Banks (Proc. Calif. Acad. Sci., vol III, p. 352, 1904) records it from Claremont and Zebra (Madera County).

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ADVICES to the States Department from Consul General Guenther at Frankfort, indicate that a real preventive of mosquitoes has been found. He says: "The director of fisheries at Diebrich, has, after experiments covering a period of fourteen years, found that the most reliable means against mosquitoes in stagnant waters is the growing of the various kinds of the semi-tropical plant arzola.

"The plant suffocated all the mosquito larvae below and prevented the living insects from depositing their eggs in the water."

## A New Euceros.

By P. H. HERTZOG, Bucknell University, Lewisburg, Pa.

**EUCEROS** Gravenhorst (**EUMESIUS** Westwood).

### TABLE FOR DETERMINATION OF SPECIES.

Posterior tibiae black or dusky, yellow at base.

Coxae, femora and abdomen rufous . . . . . **frigidus** Cress.

Coxae black to yellow.

Abdomen, except basal segment, rufous . . . . . **couperii** Cress.

Abdomen black, with apical half of all the segments yellow, stigma black; scutellum at base and most of hind coxae yellow.

**obesa** Davis.

Abdomen varied; stigma rufous.

Black and yellow and always with a more or less distinct median longitudinal yellow stripe; hind coxae and scutellum at base mostly black . . . . . **canadensis** Cress.

Brown, almost black along margin; yellowish stripe on segments 1-4 not distinct . . . . . **vierecki** n. sp.

Posterior tibiae rufous, sometimes yellow at base.

Hind tarsi rufous, with median segments yellow; wing very dark at apex . . . . . **sanguineus** Davis.

Hind tarsi unicolorous, wings faintly dusky at apex.

Sternum lemon yellow.

Notum black and yellow . . . . . **thoracicus** Cress.

Notum and abdomen dark rufous . . . . . **facies** Davis.

Sternum color of the remainder of thorax.

Abdomen fulvous, with more or less distinct, transverse yellow spots; thoracic vittae yellow . . . . . **medialis** Cress.

Abdomen and thorax uniform bleached fulvous . **flavescens** Cress.

### **Euceros vierecki** n. sp.

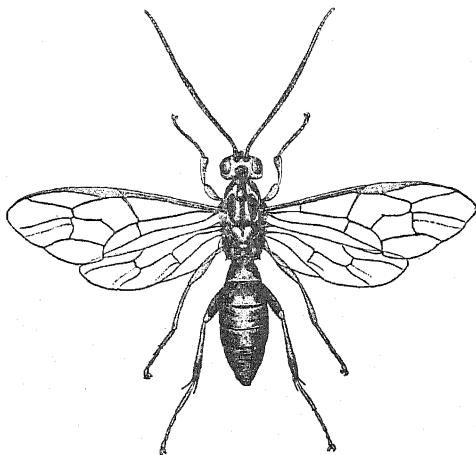
♂ differs from *Euceros canadensis* Cress., as described on page 254 Trans. Am. Ent. Soc. XXIV, by Mr. G. C. Davis, in having the hind coxae uniformly black underneath and inner portion as well as above; sternum black; pleura black with distinct yellow markings; antennae black, fulvous at apex and are only slightly enlarged in middle; median yellowish stripe on segments 1-4 not distinct; there are no black cross bands on the abdomen. The general color of the abdomen is brown, almost black along the margin and yellowish median stripe. Length, 10 mm.; wing, 9 mm.

*Type Locality*.—Harrisburg, Pa., June 13, 1908 (P. H. Hertzog).

Type will be deposited in the collection of the American Entomological Society, Philadelphia, Pa.

In running the specimen over the table prepared by Mr. Davis in reference quoted above, it readily traces as far as *E. canadensis* Cress. In the description of *canadensis* there are many characters in common to *vierecki*. But the differences pointed out in the comparative description are decidedly too marked to pass under the same species. The table or key in this paper is practically in substance that of Mr. G. C. Davis, but the first group has been entirely rearranged and partly changed so as to show the relation more clearly as well as to simplify the arrangement and incorporate the new species.

One male was caught while it was flying about some weeds



*Euceros vierecki* Hertzog.

mostly *Ambrosia trifida* L. A number of Braconids and Ichneumon-flies were in its company. This seems to indicate that the species no doubt is a beneficial parasitic insect. Of European species it may be noted that *E. crassicornis* Grav., is parasitic on *Cidaria barberaria* and *Thecla quercus* and *E. superbus* Kriechb., is parasitic on *Callimorpha dominula*.

It gives me great pleasure to dedicate the species to Mr. H. L. Viereck of the Bureau of Entomology, Washington, D. C., who has given me much encouragement in the study of Hymenopterous insects. The illustration is due to the kindness of Mr. W. R. Walton, Harrisburg, Pa.

## Descriptions of the New Cynipidae.

BY WILLIAM BEUTENMULLER.

**Rhodites nodulosus** sp. nov.

*Female.* Head, black, opaque, finely and evenly rugoso-punctate, with scattered whitish hairs. Antennæ wholly black and pubescent. Mandibles rufous, black at the tips. Thorax subopaque, with rather large coarse punctures. Parapsidal grooves broad, not deep and rugose. Median groove from the scutellum broad, not deep and extending forward to nearly the ends of the parallel lines. These are almost smooth, somewhat shining and scarcely reach the middle of the mesonotum. Lateral grooves very fine and scarcely evident. Pleuræ finely and densely rugoso-punctate with a large shining area. Scutellum well rounded posteriorly, evenly rugose and without foveæ at the base. Abdomen, red; anal segments, black or blackish; ventral sheath, jet black; first and second segments, smooth, remaining ones rather densely covered with short decumbent hairs on the dorsum and sides. Venter, smooth and without hairs. Legs, reddish and pubescent. Wings, yellowish hyaline, radial area darker than the rest of the wing. Veins dark brown, cross-veins heavy. Areolet present. Cubitus distinct and extending to the first cross-vein. Length, 3 to 4 mm.

*Gall.*—On the two tender twigs of wild rose (*Rosa lucida*?) It is an elongate, slight swelling of the branch and sometimes scarcely distinguishable from the rest of the branch. Inside is a single, short, elongate chamber inhabited by a single larva, which when fully grown fills almost the entire chamber. Length, 8 to 12 mm.; width, 2 to 4 mm.

*Habitat:* Magnolia, Massachusetts (Miss Cora H. Clarke); Evanston, Illinois (Lewis H. Weld).

A large and distinct species, allied to *R. dichlocerus*, but with the color of *R. rosae*, *ignota* and *bicolor*. The galls were kindly sent to me by Miss Cora H. Clarke and Mr. Lewis H. Weld. They were collected in March and April. The flies began to emerge about April 20 until early in May. The gall is sometimes an imperceptible swelling of the branch and may be easily overlooked.

**Andricus aciculatus** sp. nov.

*Female.* Head, rufous; opaque, evenly granulated and with distinct whitish hairs. Antennæ fifteen-jointed, rufous, darker terminally, pubescent. Thorax rufous, black along the lateral grooves and between and around the anterior parallel lines, densely and finely rugoso-punctate, with yellowish hairs. Parapsidal grooves, broad, distinct,



smooth, and rather widely separated at the scutellum. Anterior parallel lines distinct, not quite reaching the middle of the mesonotum. Median groove from the scutellum, short. Lateral grooves very broad, shining and extending well forward. Pleuræ rufo-piceous, finely rugose and pubescent. Scutellum, rufo-piceous, rugose, pubescent, foreæ at base oblique, shining and scarcely separated by a fine carina. Abdomen opaque, piceous, narrowly rufous at the posterior ends of the segments, distinctly longitudinally aciculated. Legs rufous, pubescent, posterior femora and tarsi piceous. Wings hyaline, veins dark brown. Areolet large, triangular. Cubitus rather delicate and scarcely reaching the first cross-vein. Length, 2.50 to 3 mm.

*Gall*.—On the side of a twig of post oak (*Quercus minor*) in March. Polythalamous. Elongate, irregular, hard and woody swelling, with the base broadly attached to the twig. Covered with a compact mass of white woolly substance, which is sometimes tinged with red or brown. The wool forms a rounded or almost globular mass on one side of the branch. Length, 15 to 20 mm. Diameter, 12 to 20 mm. Height, 10 to 16 mm.

*Habitat*: College Station (Glenn W. Herrick), and Austin, Texas (C. Hartman).

***Andricus texanus* sp. nov.**

*Female*. Head, rufous, very finely and minutely rugose, with distinct pale hairs. Antennæ, fourteen-jointed, dull rufous basally, dusky terminally. Thorax, dark rufo-piceous or almost entirely piceous. Parapsidal grooves rufous, distinct and converging at the scutellum. Median groove wanting. Anterior parallel lines distinct and extending to the middle of the mesonotum. Lateral grooves wanting. Scutellum rufo-piceous, rugoso-punctate, foveæ at base rather large and rounded. Abdomen smooth, polished, piceous. Legs yellowish brown, femora and tibiæ usually somewhat infuscated, pubescent. Wings hyaline, ciliate, veins brown, cross-veins heavy, cubitus very delicate. Areolet present, distinct. Length, 1.50 to 2 mm.

*Gall*.—In clusters, closely packed together, on the under side of the leaves of post oak (*Quercus minor*). Monothalamous. Hard, woody subcylindrical, wedge-shaped or subtriangular, sometimes more or less flattened, pointed basally at the place of attachment to the leaf. Each individual gall is densely covered with short, coarse, whitish, wool-like fibers. They are closely packed together on the leaf and have the appearance of being one large gall, but each gall may be readily separated and detached. When old the fibers turn brown and the galls drop to the ground.

*Habitat*: Austin, Texas (C. Hartman), and College Station, Texas (Glenn W. Herrick).

## A new Genus and a new Species of North American Phloeothripidae (Thysanoptera).

BY J. DOUGLAS HOOD, Urbana, Illinois.

Genus **LEPTOTHRIPS** nov.

(λεπτος, narrow; φρυψ)

Body unusually slender. Head long, narrow, nearly twice as long as broad, widest across eyes, narrowed at base. Eyes finely faceted, prominent, bulging, projecting beyond the general outline of the head. Vertex elevated, conspicuously prolonged, overhanging the insertion of the antennæ, and bearing the anterior ocellus at its extremity. Mouth cone moderately short, about as long as its breadth at base, reaching nearly across prosternum; labrum subacute. Antennæ eight-segmented; sense cones small, weak. Prothorax about half as long as head; spines short, blunt, scarcely visible; mid-laterals wanting. Legs slender; fore femora not enlarged; tarsi unarmed in both sexes. Wings slender, not very closely fringed, distinctly narrowed at middle. Abdomen long and slender, about three and one-half times as long as wide.

Type: *Cryptothrips aspersus* Hinds.—In this genus will also be placed a new species from Madeira, soon to be described by Mr. R. S. Bagnall.

From *Liothrips* Uzel, which should precede it in a linear arrangement of the genera, and in which should be placed the three North American species, *L. (?) ocellatus* m., *Phyllothrips citricornis* m. and *P. umbripennis* m. *Leptothrips* may easily be distinguished by the much slenderer form, the longer head, the more bulging eyes, the shorter mouth cone, and the weaker, slenderer wings, which are distinctly narrowed at middle. Furthermore, in five species of *Liothrips* which I have had the opportunity to examine, the double fringe on the hind margin of the fore wings consists in every case of about thirteen hairs, while in *Leptothrips aspersus* the number never exceeds seven. It might also be added that the latter is much more difficult to mount satisfactorily, the legs and antennæ almost always tending to assume some awkward

position which is frequently most trying to the skill and patience of the collector.

It is to be regretted that the name *Phyllothrips* m. can no longer be used for this insect\*; it must fall into synonymy, for its type species, *citricornis* m., turns out to be nothing more than a slightly anomalous *Liothrips*. In fact, at the time of describing the genus *Phyllothrips*, I realized that my *citricornis* was very close to the European species of *Liothrips*, and would have designated *Cryptothrips aspersus* Hinds as the type species had I been certain of my identification. But I was misled by Dr. Hinds' figure (Plate X, Fig. 104), in which the sides of the head are incorrectly represented as parallel to one another. A more accurate idea of the shape of the head may be gained by reference to ENTOMOLOGICAL NEWS, Vol. XX, No. 1, p. 32, Fig. 4; January, 1909.

I must acknowledge my indebtedness to Mr. Bagnall who, upon receipt of type specimens of *P. citricornis* m. and *P. umbripenennis* m., wrote that although he was glad that I had removed *aspersus* from the genus *Cryptothrips* Uzel, he feared that *Phyllothrips* could not stand, and suggested that I propose a new genus name for the reception of Hinds' species.

Genus **PHLOEOTHRIPS** Haliday, 1836.

**Phloeothrips maculatus** sp. nov.

*Female*.—Length, about 1.6 mm. Body, flattened. Dorsal surface, microscopically granulate; ventral surface, smooth. General color (by reflected light), dark mahogany brown, with many small white blotches; as follows: A fusiform blotch extending from eye to base of head, and followed posteriorly by several others which form an interrupted vitta, reaching well along the sides of the metathorax; dorsum of abdomen margined with a band of white spots which is about equal in width to the fore femora, and which extends around the apex of the abdomen, traversing segment 9; in this band, on each side of segments 2-7, are three more or less fused spots, the inner one largest and more or less crescent-shaped; mesoscutum with a pair of quadrate blotches near the middle; metathorax with a pair of smaller blotches situated

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\* Buffa's genus *Phyllothrips*, described in Redia, Vol. I, Fas 1, p. 123 (Dec., 1908) must of course also be dropped, being preoccupied by *Phyllothrips* m. (Can. Ent. Vol. XL, No. 9, p. 305; Sep., 1908.)

laterad of the metascutellum; antennal segments 1 and 2 marked with white; fore femora marbled dorsally with white; femora of second and third pairs and all tibiae, with an apical white blotch. General color (by transmitted light), blackish brown, with maroon hypodermal pigmentation; antennal segments 1 and 2 nearly concolorous with body; segments 3 and 5 yellow, the former clouded near apex with gray; segments 4, 6, 7 and 8 nearly black, 4 and 6 with their pedicels yellow; extremities of tibiae nearly transparent.

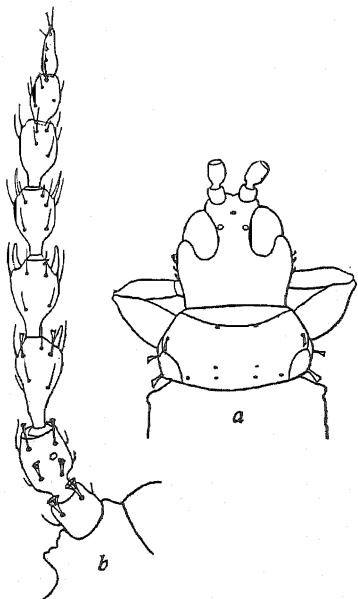


FIG. 1.—*Phloethrips maculatus* sp. nov. Female, a—head, prothorax and forelegs,  $\times 67$ ; b—right antenna,  $\times 172$ .

Head about as wide as long; cheeks swollen, dorsal and lateral surfaces with many short subclavate spines; postocular bristles wanting. Eyes reniform, finely faceted. Ocelli present, moderate in size. Antennae about one and three-fourth times as long as head; fully developed sense cones on segments 3 and 4 large, stout; those on segments 5-7 moderately slender; formula\*: 3, 0-1; 4, 1-1<sup>1</sup>; 5, 1-1<sup>1</sup>; 6, 1-1<sup>1</sup>; 7 with one on dorsum near apex; segments 1-3 with infundibuliform bristles. Mouth-cone large, attaining base of prosternum; labium broadly rounded and slightly surpassing the labrum, which is narrowed at apex.

Prothorax nearly .6 as long as head, and (including coxae) about 2.4 times as wide as long; spines dilated apically, scarcely visible.† Pterothorax wider than prothorax and slightly wider than long; sides

subparallel for half their length, then roundly converging to base of abdomen. Wings present, reaching base of tube. Legs rather short and stout; fore tarsi armed with a small acute tooth.

\*The explanation of the formula for the antennal sense cones has been given in Ann. Ent. Soc. Am., Vol I, No. 4, p. 285, and in Ent. News, Vol. XX, No. 1, p. 29, foot note.

†The prothoracic bristles are so nearly transparent that they can be

seen only after a very careful adjustment of the light. In the figure, the bases of several have been shown, although the bristles themselves could not be made out.

Abdomen large, slightly wider than pterothorax, narrowing arcuately from segments 5 to base of tube. Tube .9 as long as head and of nearly equal diameter throughout, excepting for a very slight widening at apical third and a slight subapical constriction; terminal bristles pointed, half as long as tube. Marginal abdominal bristles dilated at apex.

Measurements: Total length, 1.58 mm.; head length, .24 mm.; width, .24 mm.; prothorax length, .14 mm.; width (including coxæ), .33 mm.; pterothorax width, .38 mm.; abdomen width, .45 mm.; tube length, .22 mm.; width at base, .059 mm.; at apex, .038 mm. Antennæ: 1, 43  $\mu$ .; 2, 59  $\mu$ .; 3, 73  $\mu$ .; 4, 64  $\mu$ .; 5, 57  $\mu$ .; 6, 53  $\mu$ .; 7, 43  $\mu$ .; 8, 42  $\mu$ .; total, .43 mm.; width, 42  $\mu$ .

Described from a single specimen taken by the writer under rotting poplar bark, near Baldwin, Michigan, August 8, 1908.

This pretty species is the only one of its genus with white pigmental markings. The broad head, reniform eyes, and funnel-shaped bristles are also characteristic.

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## Some Observations in Southern Pines, N. Carolina.

BY ABRAM HERBERT MANEE, A. M.

### SCARABAEIDAE

*Canthon probus*.—March 27-July 24. In roads, abundant. Appears instantly to fresh human or horse or cow excrement.

*Canthon nigricornis*.—March, May, June. Not common.

*Canthon vigilans*.—April. Not common.

*Canthon laevis*.—March, April. Not uncommon.

*Deltochilum gibbosum*.—Only fragment of one specimen.

*Choeridium histeroides*.—May. Very abundant. Shallow burrows, under horse and cattle droppings.

*Copris minutus*.—June, October. Not uncommon in or under dried horse or cattle droppings.

*Copris anaglypticus*.—March. Very rare. Smaller than same species in New England.

*Copris carolina*.—April, July, October. Not uncommon. Burrows very deep in roads and cow yards.

*Phanaeus carnifex*.—April to late June, August. Not uncommon. In human, horse and cow excrement.

*Phanaeus igneus*.—June to September. More abundant than *carnifex*. In horse and cow excrement.

*Onthophagus hecate*.—March. Very rare.

- Onthophagus janus*.—June 29. Very rare in foetid toad stool.
- Onthophagus orphaeus* variety, *subaeneus*.—April. Rare. Horse and cow excrement.
- Onthophagus tuberculifrons*.—May, October. Very abundant. In roads.
- Onthophagus pennsylvanicus*.—April, July. Not uncommon. In roads.
- Aphodius fossor*.—Very rare.
- Aphodius fimetarius*.—October. Rare.
- Aphodius ruricola*.—April, December. Not common.
- Aphodius lividus*.—October. Not common.
- Aphodius inquinatus*.—October, November. Not common.
- Aphodius rubeolus*.—Very rare.
- Aphodius stercorosus*.—Rare.
- Aphodius luteiventris*.—October to January. Not uncommon.
- Bradycinetus ferrugineus*.—June 5 to middle August. Rare, except as haunts are found. (See Ent. News, Vol. XIX, pp. 459-460.)
- Bolbocerus lazarus*.—June to September. not uncommon. (See Ent. News, Vol. XIX, Plate XXI.)
- Geotrupes Blackburnii*.—January to December. Common.
- Geotrupes balyi*.—June. Not common.
- Trox scabrosus*.—August, October. Not common. In privies and hoof parings.
- Trox insularis*.—January. Rare. In feathers.
- Hoplia livialis*.—Late March, 1905. Very rare.
- Serica iricolor*.—April, May. Not common. On oaks.
- Macrodactylus subspinosus*.—June 8, 1907. Two specimens.
- Diplotaxis liberta*.—June. Very rare. On young loblolly pines.
- Diplotaxis rugosoides*.—November. Rare. On young long leaf pines, late afternoon.
- Diplotaxis subcostata*.—April, May. Not common. On gummy oak buds at twilight, P. M.
- Diplotaxis bidentata*.—July. Rare.
- Diplotaxis* Species?—March. Very rare. Size of *bidentata*, color of *subcostata*.
- Lachnosterna gracilis*.—April, June, August. Not common. Taken only at light.
- Lachnosterna fusca*.—April, July. Common.
- Lachnosterna micans*.—January in ground. April and June at light and flies low from 8 to 10 P. M. Not common.
- Lachnosterna praetermissa*.—Early April. Not uncommon. Flies at 4-5 P. M. among gummy oak buds.
- Lachnosterna pronunculina*.—July. Very rare.
- Lachnosterna ilicis*.—June. Rare. Flies to gummy acorns, 7 to 8 P.M.
- Lachnosterna barda*.—Late May. Very rare.

- Lachnosterna luctuosa*.—Late May. Very rare.
- Lachnosterna tristis*.—April. Abundant. Flies at 6 to 8 P. M. to gummy oak buds.
- Polyphylla occidentalis*.—Late June, July. Not uncommon. Among needles of young pines.
- Anomala flavipennis*.—June, 1905. Very rare.
- Anomala undulata*.—April. Rare.
- Anomala oblivia*.—Early June. In 1908 not uncommon. Among needles of young loblolly pine.
- Anomala minuta*.—July. Not uncommon. Rises at 4 to 5 P. M. to top of wire grass.
- Strigoderma pygmaea*.—Middle June, early July. Not uncommon. On wire grass, 10 A. M. to 12 M.
- Pelidnota punctata* variety *notata*.—Late June, July. Not uncommon on grape vines. Flies at early night.
- Cyclocephala immaculata*.—Late June to middle August. Not common. Only at light.
- Dyscinetus trachypygus*.—June. Rare. Under boards in wet banks.
- Ligyris gibbosus*.—June, July. To light. Common.
- Aphonus castaneus*.—July. At light. Rare.
- Xyloryctes satyrus*.—September 13, 1905. One male.
- Strategus antaeus*.—June 15 to middle August. Not uncommon. (See Ent. News, Vol. XIX, pp. 286-288.)
- Strategus splendens*.—January 1. In ground. May to June. In wood paths at dark. Rare.
- Dynastes tityrus*.—June 29 to late August. In orchards on ripe fruit.
- Phileurus truncatus*.—August. To light. Very rare.
- Phileurus valgus*.—December, '04-December, '05. In decay of hickory. January, '09. In decay of tulip tree.
- Allorhina nitida*.—Middle June to August. Common. Flies about oaks by day. Larvae about compost. Crawls on back in Winter.
- Euphoria areata*.—January to April. In paths and roads. Common.
- Euphoria melancholica*.—April, June, August. Common. On gum of oak stump sprouts.
- Euphoria inda*.—September. Not common. On gum of persimmon, girdled by *O. cingulata*.
- Cremastochilus squamulosus*.—May, July. Rare.
- Trichius piger*.—May, June. On *Ceanothus americana*. Common.
- Trichius delta*.—May, June. On *Ceanothus americana*. Not uncommon.
- Trichius viridulus*.—May, June. On *Ceanothus americana*. Rare. Three varieties. Bright green, blue, black and dark chestnut.
- Valgus squamiger*.—October 16, 1908. On dead bark of live hickory. January 22, 1909. On decayed oak stump. Not uncommon.

## Aphid technique.\*

BY PAUL HAYHURST.

Plant lice and similar soft-bodied insects are often considered difficult objects to preserve permanently in good condition. They cannot, of course, be pinned, for their dried bodies give little or no idea of what the real insect is. On the other hand, strong alcohol is apt to cause considerable shrinkage and the appendages become more or less brittle and easily broken. Large specimens are not so much injured as the smaller forms, which usually shrink badly. The more delicate species frequently lose much of their pigment, especially in the abdominal regions. Shrunk or distorted material is valueless for accurate measurements and is often so unsatisfactory in other respects that specific determination becomes a matter of conjecture. Alcohol is therefore rarely used by some investigators who mount most of their specimens for permanent preservation. It is, however, an evident advantage to be able to put up plenty of material quickly and easily, but if all the insects must be mounted as they are collected, comparatively few can be kept of each species. This is inadvisable, since to describe a form properly many specimens must be examined to note the variations in size, structural characters and markings, for then it is probable that fewer species would be manufactured.

An ample supply of specimens is also a real privilege in making mounts, and it allows exchanges with other workers. Mounting aphids in balsam is, furthermore, a great nuisance on a collecting trip. If a field agent must carry such slides with him as he goes from town to town, some of them at least are liable to be ruined in transit before the balsam sets, unless it is first hardened by heat. My own material preserved in the usual way has been so unsatisfactory that I have recently given considerable attention to the technique and consequently I now find my specimens in suitable condi-

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\*Contributions from the Entomological Laboratory of the Bussey Institute, Harvard University. No. 3.



tion for study. I do not present this paper as an original contribution to scientific literature, but I hope that it may be helpful to entomologists who have not given special attention to this group.

I believe that the most satisfactory way to preserve aphids for general purposes is to keep them permanently in 70 per cent. alcohol. It is advisable, however, to put the more delicate species in 35 per cent. for several hours before transferring them to 70 per cent. In this strength there is very little, if any, shrinkage. All species remain comparatively soft and the appendages more flexible and less liable to break than in 95 per cent. alcohol. Good mounts can be made with them at any convenient time. Alcoholic specimens should be kept in three or four times their bulk of fluid. If too many aphids are put in a vial, the alcohol will become weaker than 70 per cent. and may not be strong enough to preserve them permanently. If it is necessary to keep a large number of insects in one vial, the fluid should be changed once or twice a few hours after they are put in. Mr. Theo. Pergande, of the U. S. Department of Agriculture, Bureau of Entomology, advised this percentage in a letter to me, dated October 23, 1906.

Aphids preserved in about  $2\frac{1}{2}$  per cent. formalin can be absolutely depended on not to shrink. If they are fixed in hot water at about 80 degrees C. and are pricked when sufficiently hard and are kept in the dark, they will partly retain their normal color and have the advantage of looking much like the real living insects. They cannot be pricked while fresh without losing some of their contents and thus affecting their shape. Fine sewing needles (Sharps No. 12) are suitable tools for pricking small aphids. All forms can be readily submerged, if they are first passed through 95 per cent. alcohol to remove waxy secretions and to dampen the entire external surface and thus prevent the formation of a film of air around them when the formalin is poured on. They must not be left more than a very few minutes in the alcohol. These specimens will always be good material for

measurements and should be kept as checks on the alcoholic aphids, which may shrink a little.

After a comparative test of nearly two years I cannot see that the addition of a little glycerine to the formalin has kept the appendages any more flexible than has 2½ per cent. formalin. The glycerine may delay the hardening effect a little while, but as a permanent preservative does not seem superior to formalin alone, and is not likely to be so clean.

If special study is given to a species, it is well to fix some specimens in water at about 80 degrees C., then leave them several hours in 35 per cent. alcohol before transferring them to 70 per cent. for permanent preservation. As soon as sufficiently hardened they should be pricked. Such material is excellent for the study of some structures that might ordinarily be retracted, since the bodies remain very plump and the abdomens are slightly distended.

I like to keep my unmounted collection, for the most part, in 1 dram homeopathic vials, because the specimens are so easily accessible with a wide-mouthed pipette or forceps. Smaller vials than 1 dram do not have sufficient capacity for more than a very few specimens and, if round-bottomed, are a constant annoyance.

When sent in fluids by mail the insects are liable to be received devoid of the normal number of appendages and are almost as unfit for determination as aphids sent, like so many flowers, in a letter. The best way to mail specimens in fluids is to crowd them securely in place with a wad of lens paper. Space can be allowed for the labels above the paper. Other things then being equal the insects will reach their destination in good shape. Cotton is not so useful as lens paper because the appendages will be entangled with the fibers.

It is necessary to mount plant lice for detailed study with a compound microscope. To secure good mounts with little or no shrinkage, specimens taken from the stock collection in 70 per cent. alcohol, are first pricked in the abdomen to secure thorough dehydration; they are then transferred to 95 per cent. for several hours, and are next placed in absolute to

prepare them for xylol in which they are cleared, and after a few minutes are mounted in Canada balsam. It is convenient to support the cover glass on wax feet, which are made by mixing beeswax with a little balsam and lampblack. In this way a specimen can be fixed in any desired position by adjusting the cover glass. Bits of broken glass are sometimes used instead of wax feet, but they are not so desirable because they do not yield to pressure. If the specimens are not pricked, or if they are cleared in anything containing carbolic acid, they are liable to shrink badly. If thorough dehydration is not secured, the specimens will collapse completely and turn whitish. Material properly dehydrated and cleared will become still clearer in time. Too much clearness is a disadvantage, since a certain opacity is more easily studied. To avoid this it is advisable to pass the pricked specimens from 70 per cent. to water, then stain several hours in alum cochineal, dehydrate gradually, clear and mount in balsam. Such specimens are opaque enough, and more or less of the internal structure can be traced. Or, if preferred, they can be stained directly from 70 per cent. in Grenacher's borax carmine. Unstained mounts can be made without clearing by passing pricked specimens from 70 per cent. alcohol to water and mounting in Farrant's medium. This medium becomes hard much quicker than balsam, but has the disadvantage of holding bubbles permanently. It does not require sealing. These mounts are clear enough for many purposes and will never become too clear. If the procedure is properly carried out, they will not shrink.

Pure glycerin is a good medium for making temporary mounts from water. If pricked aphids are mounted from water in glycerin jelly and the cover glass is completely sealed with shellac, they will last a long time. This medium is rarely used now by histologists except for temporary mounts, as the objects are likely to be disappointing after a time and sealing is troublesome.

A very common method of mounting aphids is to put them fresh in balsam without dehydration. Although this has

some advantages, there are so many objections that I do not use it. Some of the pigment is always drawn out of the body and stains the balsam. If the atmospheric conditions are unfavorable at the time of mounting, the surface will be obscured by a cloud caused by moisture. Although such mounts do finally "clear up" to a certain extent, they are never entirely satisfactory and shrinkage is apt to occur after a time. They are rather shocking to a person used to modern technique. Closely related species thus mounted are often scarcely distinguishable. This method of mounting is precisely that used by nature in the Tertiary period in the formation of the amber specimens.

In collecting aphids I find that small tin boxes with tightly fitting covers are most convenient. Infested leaves are trimmed of uninfested parts and placed in a box. If the cover does fit closely, the leaves and the insects will not dry up in less than 24 hours; thus the collector has time to make notes and preserve plenty of material on returning to the laboratory. They can be quickly chloroformed in the box and thus the nuisance of crawling plant lice may be avoided. But it is not safe to use chloroformed material for color notes. These are best made with living examples held in place under a cover glass and examined with a high power hand lens. Mr. C. E. Sanborn has published a guide for taking notes of living aphids (U. S. Dept. of Agric. Bur. Ent. 60 (n. s.) p. 165). This prevents omissions and secures uniformity so that related forms can be easily compared. But the only satisfactory means of recording the color is by colored drawings of living insects. Needless to say they are far better than mere words, which, however, have to suffice in general collecting.

Considerable information is obtained on the habits and development of aphids by insectary breeding experiments supplemented with field observations. To enable the insects to attain their normal size they must be allowed to develop on freshly growing plants. These can be secured for indoor

studies by potting healthy specimens. To prevent accidental injury and to keep away parasites, which may enter through the open doors and windows, the plants can be covered with Welsbach chimneys, whose upper end is closed with Swiss netting. Yet even with the greatest care an experiment in individual breeding occasionally fails through the mysterious disappearance of the insect. This is undoubtedly because the aphid becomes restless, if the supply of food is not perfectly satisfying, and wanders down and is lost in the apparatus. Therefore, if the observer notes that a certain number of young larvae are with the adult, he knows that she produced this number since the last record was made, but he cannot know how many more were born that wandered away and were lost. Consequently, if absolutely reliable data are to be secured, each insect must be confined so that, if it dies, it can be easily found. For this purpose I have used successfully glass tubing of a large diameter. The portion of the potted host carrying the insect is placed in the tube, which is securely held in place by attaching it to a stick thrust in the soil. The upper end is closed with fine netting, and the lower end is plugged with cotton, to prevent the escape of the insect along the plant stem. If black cotton is used, any light-colored plant louse or exuvium that falls on it will be easily seen. By using succulent, healthy plants and reasonable care, reliable results can thus be obtained. If the apparatus is kept in diffuse daylight and not too much plant tissue is placed in the tube, moisture and fungi will not be especially troublesome. Mr. J. J. Davis has secured the individual life history of *Aphis maidi-radici* by using large glass vials as vivaria in which the plant is kept growing with a ball of moist cotton at the bottom. (U. S. Dept. Agric., Bur. Ent., Tech. Ser., No. 12, Pt. VIII, p. 124-5.)

I believe that by giving careful attention to the proper methods the Aphididae can be studied as advantageously as any other group of insects. I wish to acknowledge Professor Wheeler's kind criticism in the preparation of this article.

## Some Anthidiine Bees.

By T. D. A. COCKERELL.

### **HETERANTHIDIUM** Ckll., 1904.

To this genus must be added *Heteranthidium occidentale* (*Anthidium occidentale* Cresson) and *H. zebratum* (*Anthidium zebratum* Cresson). Mr. S. A. Rohwer has taken *H. zebratum* at Boulder, Colorado, during the latter part of August, at flowers of *Helianthus pumilus*.

### **Dianthidium inerme** (Friese).

*Anthidium inerme* Friese, 1908. Mendoza, Argentine. I am indebted to Dr. Friese for a specimen.

### **Dianthidium zebra** (Friese).

*Anthidium zebra* Friese, 1904. Willowmare, Cape Colony. My specimen is from Dr. Brauns.

*A. braunsi* Friese has no pulvillus, and belongs to *Anthidium*.

### **Dianthidium siculum** (Spinola).

*Anthidium siculum* Spinola, 1838. My specimens are from Tangier and Rabat, Morocco.

### **Dianthidium ulkei** (Cresson).

A series from Colorado and New Mexico, which I have hitherto referred to *D. parvum* (Cress.), includes two distinct things, the commoner one being *D. ulkei*. This is readily separated from *D. parvum* and other allies by having the tibiae on the outer side wholly yellow in both sexes. The seventh segment of the male abdomen is broadly truncate, yellow with the edge hyaline, the lateral corners rounded, and the small median projection not bounded by notches. The hind coxae have yellow spines. In the female, the dot above clypeus, and those behind the ocelli, mentioned in Cresson's description, are more often absent than present. The specimens of *D. ulkei* before me come from the following places: Campus of University of Colorado, Boulder, Colorado, July 15 (Ckll.); Boulder, Colo., at flowers of *Grindelia serrulata*, Sept. 3 (Ckll.); S. Boulder Canon, Colo., at *Grindelia*, Aug. 9 (Ckll.); Raton, New Mexico (W. P. Ckll.); Pecos, New Mexico (T. D. A. & W. P. Ckll.).

Genuine *D. parvum* comes from Florissant, Colorado at *Erigeron*, June 21 (*S. A. Rohwer*); Las Vegas, New Mexico, June 15 (*N. E. Cochran*); and Dripping Spring, Organ Mts., N. M., August (*Ckll.*).

***Anthidium conspicuum* Cresson.**

This fine species has hitherto been known only in the female. Last year I obtained two males at Boulder, Colorado, July 15 (on campus of University of Colorado) and July 16. The male resembles the female very much, with the exception of the usual sexual differences. The following characters are diagnostic: Clypeus and lateral marks pale yellow, the latter broadly truncate above at the level of the antennæ; antennæ entirely black; yellow band on vertex reduced to a large stripe on each side above eye; hair of head and thorax above very slightly ochreous; thorax with very little yellow, tubercles with yellow spot, mesothorax with a pair of small yellow spots in front, scutellum with a pair of yellow marks; seventh abdominal segment yellow with a median black spine and narrow brown margin, the lateral lobes pointed. This is very distinct from the male of *A. illustre*, and comes nearer to *A. serranum*. The following table separates the three males:—

Middle of seventh abdominal segment with a shining tubercle, but no distinct spine; clypeus with a large cuneiform black mark.

***illustre* Cress.**

Middle of seventh segment with a short spine; clypeus with a large cuneiform black mark . . . . . ***serranum* Ckll.**

Middle of seventh segment with a rather long spine; clypeus without a black mark . . . . . ***conspicuum* Cress.**

***Anthidium pondreum* Titus, var. a.**

♂ Seventh abdominal segment entirely black. This is in all other respects a normal *A. pondreum*; the sixth segment has a very broad, bright yellow band, notched in the middle, and the tibiae are mainly yellow on the outer side. It seems possible that the insect may be a hybrid between *A. pondreum* and *A. tenuiflorae* Ckll.

*Hab.*—Campus of University of Colorado, Boulder, July (*W. P. Cockerell*.) I have normal *pondreum* from Boulder and Jim Creek, Boulder County, collected by Mr. A. M. Hite.

## New South American Butterflies.

A. G. WEEKS, JR.

***Garystus benchos* sp. n.**

Head, palpi, thorax, abdomen and legs, dark reddish brown, lighter beneath. Antennae, dark brown with white annulations at base of each joint, tip white at base, black at end. Upper side of fore wing rich blackish brown. Apex dashed with white. Across discoidal space, near its end is a prominent transparent white band or mark, and below it in first submedian interspace, but nearer margin, is another of similar size. In interspace below this and midway to base at junction of median nervure and nervule is a third transparent spot of similar size. In apical area semi-distant between the first two spots and apex is a small well defined transparent white spot, nearly circular. Hind margin has slight fringe of lighter color. Upper side of hind wing the same ground color as fore wing, with no markings except two minute but distinct transparent spots or dots midway between end of discoidal space and hind margin. Fringe very light brown approaching white at center. Upper side of fore wings dark brown, nearly black in basal area. The four transparent white spots same as above. Near the apex, in the first seven interspaces below costa are dashes of bluish gray. In the two interspaces below the apical dot, and under the dot are also two similar dashes. The white dash appearing at apex on upper surface is wanting on under side. Under side of hind wings, dark rusty brown with scattered whitish scales. The two transparent dots are encircled with very dark brown extending somewhat, in linear form, towards anal angle. Fringe the same as on upper surface. Expanse, 2 in.

*Habitat*: Bolivia, two hundred miles north of Cochabamba.

This species was supposed to be *C. basoches* Linn ♀ but it is not. It is not represented here or in English collections.

Taken about five days travel north from Cochabamba in August.

***Callimormus elides* sp. n.**

Upper side of head, palpi, thorax and abdomen dark brown; beneath, nearly white. Antennae dark brown tipped with black. Upper side of fore wing dark brown. Near the apex are two clear but small subcostal white dots. There are also three subcostal white dots, almost imperceptible, nearly midway from the first mentioned and the base. In the submedian interspace in the centre of the wing are two distinct white spots, the upper and smaller one being nearer the hind margin but touching the larger spot below it. The hind margin has a



very slight fringe of ground color. Upper side of hind wing dark brown without markings. Under side of fore wing dark brown but much lighter than upper surface. There is a tendency to lighter shading towards apex. The subcostal spots are the same as on upper surface, but the spots nearer base are more prominent. The two submedian spots are also repeated, the lower one suffusing slightly towards the inner margin. Under side of hind wing dark brown with a suggestion of rust color, the basal area of lighter color with a blotch of the ground color near the costa. In the outer wing area is an irregular light band of basal area color, somewhat ill defined, extending from near the centre of inner margin to a point a little below the upper angle, nearly imperceptible as it approaches angle. Expanse, 1 inch.

*Habitat*: Suapure, Venezuela.

One specimen is in the British Museum, unnamed.

***Atrytone chingachgook* sp. n.**

Head and palpi above, dark brown; beneath, white touched with rust color. Antennae dark brown tipped with rust color. Thorax and abdomen dark above, dark brown; beneath, a lighter brown. Upper side of fore wing, dark brown matching thorax. Near apex, in interspaces below the costa, are three or four rust colored spots, extending in a line downwards in the direction of lower angle, followed by three larger whitish spots running in a line and increasing somewhat in size towards base, the whole forming an imperfect semi-circle around the end of discoidal space. Margin slightly fringed with dark brown hairs.

Upper side of hind wing dark brown without markings, matching ground color of fore wing. Marginal fringe the same. Under side of fore wing shows spots as on the upper surface. The apical area and costa rust color. The area below the median nervure and to the lower angle is dark mouse color, approaching black near the base. Under side of hind wing rust color. From upper angle extending across the wing to centre of inner margin is an indistinct lightish line or band, dusted with rust color and more or less prominent on different specimens. Slightly nearer base is another similar line reaching inner margin midway between termination of first band and the base. Expanse, 1.12 inches.

*Habitat*: Suapure, Venezuela.

This species is not represented in the Strecker and other collections, nor in the British Museum, etc.

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D. L. VAN DINE has moved from Hawaii Agricultural Experiment Station, Honolulu, to Dallas, Texas, P. O. Box 208.

## Notes on some New Jersey Lepidoptera.

By HERMAN H. BREHME, Newark, New Jersey.

The season of 1908 came in good and looked as if it was going to be a record-breaker for caterpillars, but the hopes of collectors were soon shattered. The season as I found it was on the whole, as follows:

*Lycaena pseudargiolus* and its variations were all rare. There used to be no trouble in collecting from one hundred to one hundred and fifty specimens in a day, but last season three trips were made to the home of this species and less than twenty specimens in all were seen.

*Lycaena comyntas* was nowhere abundant. Other seasons this creature could be seen almost anywhere.

*Thecla augustus* was rarer last season than it has been for the last twenty years and only four specimens were seen.

*Thecla damon*:—No specimens of this species were seen by me in 1908, and only a very few since 1904. In that year the species was so abundant that if one would shake a cedar tree, which is its food plant, in the vicinity of which it bred as high as twenty specimens would fly off. Why this species should become so rare the next season is a mystery to everyone. In that year either the parasites or some disease must have attacked them and consequently reduced them almost to extinction.

*Thecla edwardsii* was not rare, but not near as common as in the two previous seasons.

*Thecla titus*:—No examples of this species were seen by me last season although search for them was made in the locality where they usually occurred.

*Thecla melinus*:—No specimens were seen for the last three seasons.

*Thecla calanus*:—The habitat of this species was not visited and consequently no specimens were seen.

*Chrysophanus hypophlaeas*:—This species which was one of our commonest butterflies not more than five years ago is becoming rarer every year, and only odd specimens were noticed last season. In 1906 it was so rare around Newark

that I was unable to get any for my collection. I did manage to get a half dozen at Barnegat City. In former years thousands of specimens could be seen almost everywhere. The cause of such a decrease in numbers must be attributed to parasites or disease of the caterpillars.

*Chrysophanus thoe*:—This is a local species and not at all common. Several trips were made to the breeding places of this species in the last two seasons, but no sign of any were seen.

*Chrysophanus epixanthe*:—Although this species is recorded from New Jersey I have never been successful in finding any.

*Pieris rapae* was, as usual, quite plentiful throughout the State.

*Anthocharis genutia*:—This species has been quite common ever since they were discovered on the Garrett Mountains near Paterson, and several hundreds were taken every season by the Newark, New York and Brooklyn collectors; but last year there was a general scarcity and the stock in the collectors' boxes is now rather low as compared with former seasons.

*Colis philodice*:—This species was as plentiful as ever.

*Terias lisa* was quite rare in late years, but last season this little creature could be seen wherever its food plant occurred and in many places in goodly numbers.

*Danias plexippus* was common throughout the State.

*Euptoieta claudia* was common throughout the State and especially near Elizabethport at the edge of the salt marsh.

*Argynnis idalia* was rare compared with other seasons. The species was very common in 1900. In that year no less than five hundred specimens were taken by me in three days at Hilton, N. J., and fully half of them were females. The reason so many were taken is that their breeding place was being destroyed. One hundred and sixty females were taken in copulation, and half of these females were liberated in another section of the State where the food plant (Violets) was in abundance. This seemed to be an out of the way place for this

species as I never took any in that region before. The transference of this species was successful as was proved by the fact that in the next season *idalia* were plentiful at this new place. On the other hand at the old grounds none were to be seen because their food plants were all destroyed.

*Argynnis cybele* and *aphrodite* were as plentiful as ever last season.

*Argynnis myrina* was very common almost everywhere, while on the other hand *bellona* was rare all over the State.

*Melitaea phaeton* was not common last season. The most harmful thing that befalls this species is the burning off of the brush every winter when hundreds of the young caterpillars are in this way destroyed.

*Phyciodes nycteis*:—No specimens of this species were seen although I went over some of the ground where they were formerly to be found.

*Phyciodes tharos* was as common as ever.

*Grapta interrogationis* and *coma* were quite rare. A very few were seen during the season.

*Grapta j-album*:—Four specimens of this species were taken early in the spring on the Orange Mountains near the South Orange Road.

*Vanessa antiopa*:—Very few were seen last season.

*Junonia coenia*:—This species was common throughout the State especially so in the southern parts along the coast.

*Limenitis ursula*:—Very few of this species were seen the past season.

*Limenitis archippus* was quite common all over the State.

*Satyrus alope* was common, especially in the northern part of the State.

*Papilio ajax* var. *marcellus*:—Two specimens were seen, one at Belmar and the other at Sea Girt.

*Papilio philenor*:—I did not see an example of this species last season.

*Papilio polyxenes* were quite common everywhere.

*Papilio troilus* was common throughout the State.

*Papilio turnus* was abundant, that is the second or summer brood.

*Papilio cressphontes* was rather rare in 1908 although in 1907 it was quite common.

The caterpillars of most of the species of *Papilio* and *Sphinx* were rare last season, and many apparently did not make their appearance at all.

*Hemaris thysbe* was rare throughout the State.

*Amphion nesus*:—No specimens were found by me and by the appearance of things none of the other collectors succeeded any better than I did.

*Sphecodina abbottii*:—This species has been rare for several years and none were seen at all last season.

*Deilephila lineata*:—This species has been rare for several seasons although it used to be very common in this section of the State.

*Pholus pandorus*:—No examples of this species were taken by me for several seasons. Years ago there would have been no trouble to obtain fifty to one hundred caterpillars.

*Pholus achemon*:—This species has also been getting rarer and very few are now found in this section.

*Ampelophaga choerilus*:—This species is practically extinct in and around Newark. No specimens were taken by me for the last six years, although very close search was made for them.

*Ampelophaga myron* has been as common last season as heretofore.

*Ampelophaga versicolor*:—No specimens were found by me last season. This species has always been rare around this part of the State.

*Phlegethontins quinquemaculata* has not been as abundant last season as in former years.

*Phlegethontins carolina*:—This species apparently received a severe blow in 1907. Hundreds of caterpillars were found in that year, but fully ninety per cent. was parasitized. The result of this parasitism was that there were practically no caterpillars in 1908.

*Phlegethontins cingulata*:—No specimens of this species were found by me since 1899. In that year fifteen caterpillars were taken by me on morning glory.

*Sphinx kalmiae*:—Was not found around this section for the last two years as far as I am aware.

*Sphinx drupiferarum* has become a rare species around this section and I only found six caterpillars last year.

*Sphinx gordius* can be counted among the rarities in this section. This species used to be so very common that it was not difficult to secure several hundred caterpillars in a season if wanted. I have not found any in the last five years. This is another species which is generally a victim to parasitism. Undoubtedly the decrease in numbers in late years is largely due to this cause. There is still sufficient food plants around this vicinity, but the larva is probably a thing of the past.

*Sphinx luscitiosa* has seen its best days in Newark, and next year will probably see the last of them. This can be quite certain as far as the old collecting ground is concerned, as this will be destroyed in the coming year.

*Sphinx chersis*:—Has been quite common last season, but fully ninety per cent. of them were infested with parasites. This will undoubtedly mean a decrease in numbers of this species next season.

*Sphinx eremitus*:—No specimens were found by me.

*Sphinx plebeia*:—No specimens were found by me, but both this species and *eremitus* were taken in fairly good numbers by Jersey City collectors.

*Dolba hylæus* is a thing of the past as far as Newark is concerned.

*Chlaenogramma jasminerarum* was a rare insect last season and as far as I am aware none were secured.

*Ceratonia amyntor* was very rare in the vicinity of Newark. About a dozen were taken by me and by all accounts other collectors did not do much better.

*Ceratonia undulosa*:—This species has been rather rare last season compared with former years. None were taken at the old breeding places around Newark. A few were picked up in Hudson County.

*Ceratonia catalpa*:—This species invaded New Jersey several years ago in great swarms and in 1907 it could be found al-

most anywhere the food plant *Catalpa* occurred and it was a pest in the Nurseries as far north as Eagle Rock. But most of them were infested with parasites. The work of this little insect put a complete check on to this species, and last season very few caterpillars were seen. If the parasite did not do such good work the catalpa sphinx would be a pest to the nursery as bad as any insect that they have to contend with, aside from the San Jose scale.

*Lapara coniferarum*:—This is a rare species and no specimens were taken by me in the last two years.

*Smerinthus geminatus* used to be a very common species in Newark, but was very rare in the last two years.

*Paonias excaecatus* was very abundant in 1907 but in 1908 they took a big drop and not more than fifteen caterpillars were taken by me. Most of the pupæ must have died during the winter 1907-08 as very few of the caterpillars taken in 1907 were infested with parasites.

*Paonias myops* fared on the whole about as well as *excaecatus*.

*Paonias astylus*:—This species is a thing of the past in Newark, due largely to the elimination of their food plants. This species is more protected from parasites than many of the other species, but has always been counted amongst the rarities.

*Cressonia juglandis* was not as abundant last year as in former years, but was not at all rare.

*Philosamia cynthia* has been common around Newark for many years. Hundreds of the cocoons are collected every Fall, but there seems to be no apparent decrease. Cynthia seems to be very local and only in late years are they spreading southward. They are now found at Elizabeth but not further southwest than that city. It looks as if they took a southwest course and are going to follow the coast line. South Amboy is the farthest place south and west from Newark, where it has so far been found in New Jersey.

*Samia cecropia* has also been a common species in Newark, there never was much trouble to secure several thousand co-

coons in the Fall, if wanted, but this cannot be said at the present time. The reason for such a decrease in the numbers of this species has been explained. In 1907 a disease attacked the caterpillars which seemed not to inconvenience them until they began spinning their cocoons. Then they died without pupating, sometimes even before the cocoon was completely finished. The parasites also had a share in the work but were not as effective as the disease in causing a material decrease in the numbers of the species. The result is that in some places where hundreds could have been secured three years ago, there was not an indication of one last year. It will undoubtedly be several years before this species obtains a solid footing again in this vicinity.

*Callosamia promethea*:—This species was not very rare last season, but for some unknown reason, was not as abundant as in former years.

*Collosamia angulifera* has not been any more rare than in former years.

*Actias luna* has been quite abundant last season. It has not been at all common heretofore, but last year it turned up in good numbers in many parts of the State. Fully 50 per cent. were infested by parasites. There will undoubtedly be a decrease in numbers of this species next year.

*Telea polyphemus* took a big drop last year. The same disease and parasites that infested the *cecropia* also did its work with this species. Fully 90 per cent. less were found in 1908 than in 1907.

*Hyperchiria io* was practically absent last year as far as Newark and vicinity is concerned. This species has always been common, but the parasites have reduced the caterpillars to a large extent in late years, and in 1907 they practically put a finish to their work. In that year hundreds of caterpillars could be seen hanging on the twigs, dead, due to the work of the parasites.

*Eacles imperialis* was as common last year as in previous years.

*Cithoronia regalis* was quite common, but most of the specimens were infested with parasites.



*Anisota stigma* has always been a very common species in the vicinity of Newark and was abundant in 1908.

*Anisota senatoria* was quite rare in 1906-07 but in 1908 it turned up in great numbers.

*Dryocampa rubicunda*:—This is a thing of the past in Newark. There used to be several places in Newark on which hundreds could be collected, but these places have been destroyed, and there is no chance for this species again getting a foothold.

All *Papilio* caterpillars were rare with the exception of *tur-nus*. This species turned up in great numbers in September. Eggs and caterpillars could be found on almost any tulip or wild cherry trees, but by the end of September a disease attacked the caterpillars and it was not long after that it took close searching to find any specimens at all.

It will be noticed by the above statement that many species were reduced by disease and parasites, and it will be interesting to watch conditions and take notes next season.

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## The Genitalia of the Group Noctuidæ of the Lepidoptera of the British Islands.

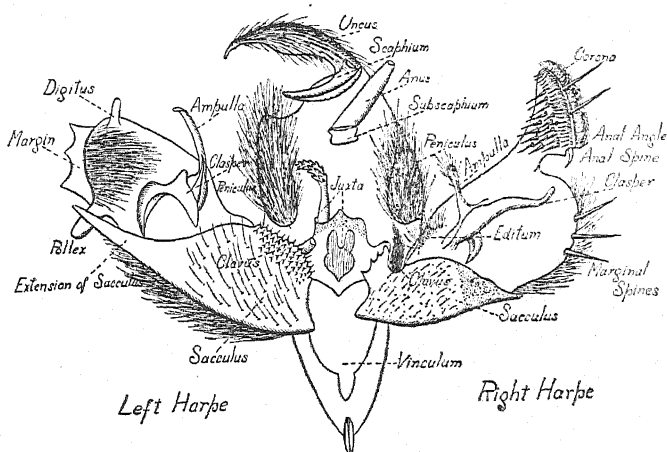
BY JOHN B. SMITH.

The above is the title of one of the most interesting and important works that has appeared concerning the Noctuidæ of any country for some years. It is not a bulky work—less than 100 pages—but there are also 32 plates with over 300 figures, illustrating almost every British Noctuid species. The author of this work is Mr. F. N. Pierce, F.E.S., of Liverpool, and the publisher is A. W. Duncan, 65 South John Street, of the same city.

The subtitle states that it is "An account of the morphology of the male clasping organs," and the first plate is devoted to an illustration of an ideal structure in which all the parts are named. This gives us, for the first time, a consistent and well considered terminology for these organs, and the figure is here reproduced on a somewhat smaller scale for the benefit of American students.

No institution and no working lepidopterist should be without this little book, which contains the results of many years of painstaking work and which assists in fixing the status of quite a number of doubtful species.

The author believes in his work—and so do I—but he is not over-assertive and does not claim infallibility; in fact he prints on the fly leaf that, "He who never makes a mistake never makes anything," and so he gives his conclusions in a systematic careful way, backing them up with figures which, to one who has examined as many of these structures as I have, bear all the indications of accuracy.



Possibly my approbation of this essay may be explained in large part by the fact that Mr. Pierce's conclusions are so exactly like my own on the same subject and that his work bears out to the full my own contentions as to the importance of these structures in the determination of species.

There is no such thing as abstracting a work of this kind; it must be read to be appreciated.

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C. T. BRUES has been appointed instructor in economic entomology at Harvard under Professor Wheeler and will take up his residence there the beginning of September. His address will be Bussey Institution, Forest Hills, Boston, Mass.

## Observations on the Mating Habits of *Oecanthus*.

By C. O. HOUGHTON, Newark, Delaware, Entomologist,  
Delaware Experiment Station.

On September 25, 1908, the writer collected two male and two female tree crickets on peach trees, set last Spring, in an orchard on the College Farm near Newark, Del. They proved to be *Oecanthus nigricornis* Walk., ♀ ♂; *O. nigricornis* var. *quadripunctatus* Beutenm., ♂ and *O. Nigricornis* var. *argentinus* Sauss., ♀\*. These specimens were placed singly in shell vials and brought to my laboratory, where they remained, separated, over night. At 9 o'clock the following morning I placed the pair of true *nigricornis* in a large glass cylinder containing sections of small peach limbs with their leaves and the other pair in another glass cylinder which was similarly equipped. As soon as the males discovered the females they began to trill, the sound being produced by rapidly rubbing the tegmina together while they were held aloft over their backs, at right angles, or nearly so, to the body axis. These trills, which lasted from five to ten seconds each, were repeated at short intervals and the males kept working gradually toward the females. When thus moving, the tegmina would sometimes be lowered but frequently they would be held aloft as the insects advanced. At first the females seemed a little shy and kept out of the way of the males. This continued for about half an hour when (about 9.30 A. M.) my observations were unfortunately interrupted and I was obliged to leave the laboratory for a time. At 10 o'clock, or very close to that time, I returned and found both females resting upon the backs of the males, each with her mouth closely applied to a depression in the dorsal part of the thorax, just behind the base of the wings. Each female was resting with the tarsi of the first pair of legs upon the femora of the middle pair of legs of the male and was working away at the depression, from which she seemed to be securing a thick, glutinous liquid; this was, apparently, swallowed.

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\*Determined by Mr. A. N. Caudell, through courtesy of Dr. L. O. Howard.

Finding that it was impossible to give close attention to both pairs at the same time, I confined my observations mainly to the pair of true *nigricornis*. The reason for selecting this pair was that the female was seen to have what appeared as a tiny ball or sac, considerably smaller than the head of an ordinary pin, attached by means of a slender peduncle at a point near the base of the ovipositor. None was observed on the other female at this time.

While the female *nigricornis* kept working away at the thoracic depression of the male, the latter remained quiet, *i. e.* did not trill; but if she started to leave he would trill, whereupon she would generally return to her work. If she moved entirely off his back he would trill and back towards her. It was quite evident that he enjoyed her presence there and evidenced the fact by switching his antennae and rolling his head; the wings were also kept moving slightly in and out. Finally the female left the male, and, retiring to a point a short distance away, elevated her body, at the same time curving forward the end of her abdomen, then reaching forward between her legs she seized the sac that still remained attached near the base of the ovipositor and detached it. She then settled down upon the leaf and proceeded to manipulate it with her mouth parts for a time, after which she chewed it up and swallowed it. Following this she rested quietly on a leaf for some time, as did also the male in another part of the cage.

Random observations upon the other pair of crickets showed that they went through practically the same maneuvers.

At about 11.15 A. M. the male *nigricornis* again began to move about somewhat, and at 11.17 reached the leaf upon which the female rested. He immediately began to trill and back up towards her, but she kept moving away. This maneuvering continued until 11.38, when she again mounted his back and received another sperm sac from him. In doing this she lowered her body and curved the end of her abdomen downward somewhat, while he raised his body and backed up,

his cerci apparently acting as guides in reaching the necessary position. The process required but a few seconds—not exceeding 8-10—for completion, after which the female began to work away again at the thoracic depression. At 11.49, or just 11 minutes after she mounted his back, the female left the male and took up her position on another leaf, while the male began to move about nervously. At 11.50 the female prepared to remove the sperm sac and this was accomplished at 11.51. She immediately began to manipulate it with her mouth and three minutes later had swallowed the last of it. She then put her mouth to the leaf just beneath and began to move it about as if searching for any particles that might have been dropped.

I had just finished my observations upon this pair when the other pair assumed the proper positions for the female to take another sperm sac. This was accomplished at just 12 o'clock. Following this she worked away at the thoracic depression for nearly 20 minutes; this was not wholly continuous, however, for she would sometimes leave the male for a few seconds. He would invariably follow, trilling, and she would soon go back to work again. At 12.19, however, she lost her hold and fell and the male immediately began to run about nervously and trill. But he failed to find her and she soon took up a position on a leaf near the bottom of the cage. At 12.21 she raised her body, brought the end of her abdomen forward and cleaned off her ovipositor after having first touched, with her mouth parts, the sac. Apparently she was in no hurry to remove it, for she leisurely cleaned her ovipositor, allowing the sac to remain until 12.22½. She then seized it, pulled it off and ate it. Her feast was finished at 12.24.

I left the laboratory shortly thereafter, for lunch, returning at 1.45. I found the pair of *nigricornis* separated and resting quietly on the leaves, having, apparently, remained inactive during my absence. The other pair were close together on a small branch which was standing nearby perpendicularly, the female headed up and the male down. She was close to

some egg-scars on the branch and I thought that she had been ovipositing. The pair remained quietly in this position until 1.51, when the female began to drill a hole with her ovipositor. Two minutes later the male trilled. At 1.57 the male trilled again, dropped his tegmina, moved over in front of the female and raised the tegmina again. The female paid no attention to him, however, but removed her ovipositor, cleaned it somewhat with her mouth, then moved down and began to cover the egg. This she did by biting off some of the bark in the immediate vicinity of the outer end of the egg, mixing saliva with this, apparently, and pasting the mixture over the egg-scar. While she was thus engaged, the male kept moving about, trilling occasionally, and finally went to the top of the branch upon which they had been resting. At 2.17 the female began eating a peach leaf at a point where it was partly bad. Previous to this she had been moving about the cage considerably and once got into position to receive another sperm sac from the male. For some reason, however, she did not secure one and she immediately left him. At 2.19 the male again approached the female, trilling, but she moved away from him. They soon assumed positions on separate leaves where they rested for some time. At 2.34 the male again sought the female and, trilling, backed up to her with tegmina raised; she, however, paid no attention to him. At 2.42 the male again backed up to the female and she assumed the old position upon his back, but would make no effort to secure from him another sperm sac, although it was evident that he made an attempt to give her one. Whether or not she received one from him soon thereafter I cannot say, as my observations on this pair ceased for a period about that time. At 4.05, however, she was seen to be working away again at the thoracic depression and she had another sac attached near the base of her ovipositor.

I am under the impression that this was the third sac for the day, in fact I feel quite positive that it could not have been otherwise, but possibly it was the fourth.

She continued to work away at the depression more or less

continuously until 4.23, when she left him and moved over upon another leaf. He followed, trilled, and backed up in front of her with tegmina raised. She reached under her body and touched with her mouth the sperm sac, but did not detach it. Then she went to work upon the male again. She soon left him, however, and at 4.26 detached the sac and began to eat it. While doing this she was interrupted by the male, who again sought her out, trilled and backed up under her, forcing her to notice him. She started to again work upon him, but stopped almost immediately and moved away, the male following her and trilling. At 4.30, whether intentionally or otherwise, she dropped to the bottom of the cage, while the male mounted to the top of the branch and began to clean his antennae and tarsi by passing them through his mouth parts. A couple of minutes later the female assumed a resting position upon a leaf near the bottom of the cage, and began to clean her ovipositor. This ended my observations on the pair for the day.

The other pair (*♂ nigricornis* var. *quadripunctatus* and *♀ nigricornis* var. *argentinus*) remained comparatively quiet all the afternoon. So far as could be observed they did not come in contact with each other at all, and I heard the male trilling but once during that time, I think.

In making the observations recorded above, I did not see what I would term true copulation—simply the reception by the female of the sperm sac from the male. Dr. Hancock\* speaks of a true union of the sexes, but makes no mention of a sperm sac. Blatchley (see below) states that he observed no intromittent organ of the male or "any union of the parts

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\*The habits of the striped meadow cricket, *O. fasciatus* Fitch, Am. Naturalist, January, 1905, Vol. XXXIX, pp. 1-11.

It should here be stated that the observations above recorded were made and notes taken thereon before the writer had seen this admirable paper by Dr. Hancock, or the notes by Prof. Blatchley on the mating habits of the same species, as recorded in his Orthoptera of Indiana, p. 452. The references to these articles were kindly furnished to me by Mr. A. N. Caudell, through the courtesy of Dr. L. O. Howard, in a letter from the latter, dated October 23, 1908.

at the end of the abdomen." Evidently he saw only the working of the female at the thoracic depression of the male. Dr. Hancock terms this organ the "alluring gland" and thinks its functions "is solely for the purpose of alluring the female." Possibly this is so, but why does she continue to work away at this organ for a considerable period of time after the object of their union has been accomplished—the reception by the female of the male sperm sac? Can this be a provision of nature to keep her attention occupied for a time in order that the spermatozoa may have time to pass into her organs? If not thus entertained, possibly she would detach the sac at once upon receiving it from the male.

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WE have just received, as we were going to press, a new and interesting work on entomology, entitled "Our Insect Friends and Enemies, the Relation of Insects to Man, to Other Animals, to One Another and to Plants, with a Chapter on the War against Insects," by John B. Smith, Sc.D.—J. B. LIPPINCOTT, Philadelphia.

NOTE.—The undersigned has undertaken the task of fully indexing the literature of the Orthoptera of the World subsequent to the year 1900. The task is not a light one, but will, it is hoped, ultimately prove well worth the labor involved. Publication is not contemplated for many years but in the meantime the index should be of much use in various ways. By the constant use of guide cards indicating reductions to synonym, or resurrections therefrom, and the transfer of species from one genus to another, it is hoped to make this more than a mere list of names.

In conjunction with the above undertaking an exhaustive Bibliography has been attempted and geographical and systematic indices are kept, listing articles treating of the fauna of different places and citing tables and important discussions of genera and higher groups.

To facilitate the above work the writer earnestly requests separates of articles from authors writing on the Orthoptera. The importance of the request is considerable and its maker hopes that it will be favorably considered by all orthopterists. The writer will be glad to exchange separates so far as possible and stands ready at all times to transmit facts and data from the index to any one desiring such information. The index is now complete to date so far as it has been possible to secure the literature.—A. N. CAUDELL, U. S. Nat. Museum, Washington, D. C.



American Snowball Louse, *Aphis viburnicola* n. sp.  
C. P. GILLETTE, Fort Collins, Colo.

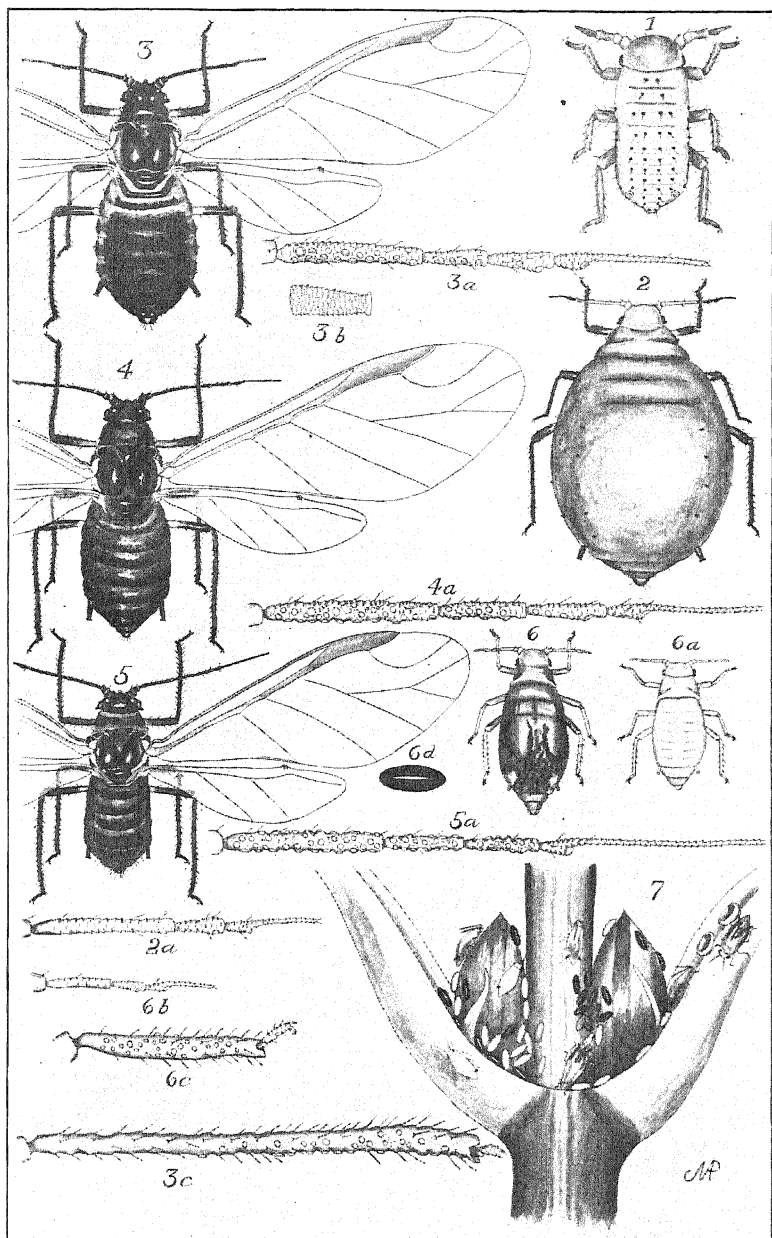
(Plate XI).

For the past nine years, at least, I have noticed the injuries of a plant louse which attacks the common snowball (*Viburnum opulus*) in Colorado. At first I supposed this to be the *Aphis viburni* described by Scopoli,\* Shrank and other European writers, but I have been unable to harmonize any of the descriptions made in Europe with the louse as I have observed it. According to Scopoli's brief description in *Entomologica Carniolica*, 1763, the apterous form of this louse is earthy in color at first, becoming black later and with antennae as long as its body. Buckton in *British Aphididae*, Vol. ii, page 79, quotes Sulzer as saying that the male of *viburni* is apterous, which is never the case with the species occurring here. Sulzer's description I have not seen. Kaltenbach (*Monographie der Pflanzenlause*, page 78) describes the apterous form of *viburni* as "blackish brown or entirely black \* \* \* the young set with strong rather long spines," and the alate form as having the thorax "black, polished; abdomen dark green," and also states that the louse occurs on the bushes from June to October. From the middle of June to about the 10th of September the snowball bushes here have been entirely free from this louse. Koch (*Der Pflanzenlause*, page 122) also describes and figures *viburni* as a black louse. Buckton's descriptions and figures of *viburni* are also quite unlike the louse occurring here upon snowball, and especially is this true of his characterizations of the viviparous and the oviparous females. For these reasons I am considering this American species new. *Young stem-mother*, Plate XI, fig. 1.

Specimens from insectary before the first molt.

Color apparently ashy gray, but the body is really a very pale greenish yellow and is heavily covered with fine gray powder. Several rows of black dots extend along the median line of the dorsum; upon the meso- and metathorax there is a double row upon either side of the median line, and these are continued over about the first five abdominal segments, where the outer rows cease, and the inner ones continue to about the eighth segment. The cornicles are hardly elevated above the surface and appear from above as two concentric black rings, the outer being the

\* I am under obligations to Mr. J. T. Monell for a copy of Scopoli's description.



APHIS VIBURNICOLA GILLETTE.



heavier. Antenna stout, five-jointed (counting the unguis), the 4th and 5th joints being united into a spindle-shaped portion strongly constricted at the base. A row of black dots also extends along either lateral margin of the body, each black spot bearing a dark hair; head, antennae and legs dusky brown; legs and antennae stout and rather hairy. Length .51 mm.

*Young adult stem-mother.*

From snowball bush in insectary, and just beginning to give birth to young.

General form very plump, color bluish white, due to the entire body, except the terminal segment of the abdomen, being covered with a white powder; eyes, distal half of antennae, cornicles, tarsi, tibiae and point of of beak black; distal halves of middle and hind femora dusky. Length of body 2.50 mm.; width 1.50 mm.; antennae .90 mm.; joints three .37; four, .11; five, .09; six, .16 mm.; cornicles, .18 mm. Cauda small, broad as long, dusky in color as are the genital plates also. Cornicles short, stout, tapering, and with moderate flange.

In alcohol or balsam the general color is pale green, sometimes showing a little orange in the region of the cornicles. Eyes dark red. Lateral tubercles of prothorax small and weak, and similar slight tubercles upon about 3 or 4 of the abdominal segment.

*Old adult stem-mother* Plate XI, figs. 2 and 2a.

The old stem-mothers taken May 18, 1908, with large colonies of their young, many of which were about to become winged, were deep green, almost a blue-green in color, with more or less white powder over the entire body. Some specimens, however, had the powder nearly all off from the dorsum. The cornicles, genital plates, hind margin of eighth abdominal segment, distal half of the very small cauda, distal ends of antennae and beak, all of cornicles, tarsi and tibiae, and greater portion of femora black or blackish. The body, legs and antennae are rather sparsely set with very delicate pubescence; lateral thoracic and abdominal tubercles very weak; eyes dark red. Upon the dorsum may be seen from 2 to 6 longitudinal rows of small black or blackish specks when specimens are put in alcohol. Length of body 2.75-3 mm.; antennae 6-jointed and about .90 mm. long.

*Young or second generation..*

The young that are given birth to by the stem-mothers are apparently white, but really slightly tinged with green or a very light yellow, and have red eyes as the only conspicuous dark parts; the tarsi and extreme end of the beak are also dusky to black. The body above lacks entirely the small black dots and dusky colorations upon the head that show upon the young of the stem-mothers, but the bodies are dusted with white powder.

*Pupa.*

The pupae vary from pale green to very pale yellow (almost white), and have no dark coloration except the red eyes and the dusky to black-

ish distal ends of antennae, beak, the tarsi, and, in some, slightly darker extreme tips of the short cornicles. The body is lightly covered with white powder.

*Alate female, second generation, spring migrant*, Plate XI, figs. 3, 3a, 3b, 3c.

From examples taken May 20, 1908, at Fort Collins, Colo.

General color above black, including legs (except proximal ends of femora), cornicles, genital plates and antennae; basal portion of the abdomen and most of the venter pale yellowish green; the dark portion of the abdomen seems really to be a very dark green, at least in younger examples. Length of body 2.50 mm.; wing 3.60 mm.; antennae 1.20 mm.; joints of antennae about as follows: three .39; four .18; five .17; six .09; seven .30 mm.; cornicles .20 mm.; cauda .10 mm., very short, and rather bluntly rounded; cornicles nearly cylindrical, a little constricted near the end, and with a moderate flange. Joints 3 to 6 of antenna rather stout, joint 3 usually with about 16 circular, slightly tuberculate sensoria of varying sizes, the number, however, is subject to considerable variation; joint 4 with 2 to 4, and joint 5 with 1 to 3 sensoria; joint 6 very abruptly constricted to the flagellum or 7th joint. On the middle of the lateral margin of the prothorax there is a short blunt tubercle and usually a similar tubercle may be seen at the postero-lateral angle; a similar but shorter blunt tubercle occurs upon the lateral margins of each abdominal segment before the cornicles; on joint 8, just anterior to the base of the cauda, is a pair of small tubercles that are nearly transparent and resemble tuberculate sensoria; beak barely attaining hind coxae; no pronounced antennal tubercles; antennae, legs and body rather sparsely set with short stout hairs; hind femora swollen in distal half, where there are 20 or more sensoria. This is the first and only case I have known of sensoria occurring upon the tibiae of a spring migrant of any viviparous female aphid.

*Winged viviparous female; return migrant*, Plate XI, figs. 4, 4a.

The head, mesothorax, antennae, tibiae, and femora at their distal ends, tarsi and honey tubes black; prothorax and style dusky brown; wings hyaline, with the veins brown, stigma dusky, subcostal vein fully twice as broad as the costal. The abdomen is rusty brown at base, with darker transverse bands towards the cornicles, and is nearly or quite black upon the middle of dorsal portion. Subanal plate black; abdomen rusty brown below, and about three black spots along either lateral margin; style very short, about one-half as long as the tarsi. Length of body 2.7 mm.; length of wing 4 mm.; antennae 1.50-1.60 mm.; cornicles .20 mm.; cornicles slightly larger towards the base. There is a small tubercle on either side of the prothorax near the hind angles. The joints of the antennae measure as follows: one .08 mm.; two .06 mm.; three .40-.48 mm.; four .22 mm.; five .20 mm.; six .10 mm.; seven .40-.48 mm., the seventh joint usually some longer than the third. Joints three, four

and five have many circular tuberculate sensoria. Joint three has about 30, four about 8, five about 4 sensoria, and six has the usual cluster at the tip. The number to a joint is somewhat variable.

*Alate male*, Plate XI, figs. 5, 5a.

Head, antennae, lobes of mesothorax, legs, except bases of femora, sternum, pleura of mesothorax and cornicles black; abdomen rusty brown; eyes very dark red, appearing almost black. Length of body 1.80-2 mm.; antennae 1.60 mm.; joints three .40; four .21; five .18; six .09; seven .51 mm. Joints three, four and five with very numerous small circular sensoria, joint three being specially rough and tuberculate; joint six very short and stout; cornicles short, cylindrical, .14 mm. long. The abdomen above is marked with more or less distinct transverse dusky dashes that are largest over the posterior half. Prothoracic tubercles usually present at hind angles; cauda very small; length of wing 3.40 mm., hyaline; stigma dusky, veins dark brown.

*Apterous oviparous female*, Plate XI, figs. 6, 6a, 6b, 6c.

The abdomen long and pointed posteriorly; when young, pale yellow, almost white in color; becoming sordid yellow to salmon-pink as they mature; eyes red; tips of cornicles and cauda blackish. Length 1.50-1.80 mm.; antenna .45-.50 mm. long, six-jointed, joint three the longest, being a little longer than 4 and 5 combined, and joint six is nearly as long as three. Cornicles short, cylindrical, not as long as hind tarsi. Hind tibiae broad, flattened, and with numerous oval sensoria of varying size throughout its length. There are no lateral tubercles upon thorax or abdomen.

A few important records at Ft. Collins are as follows:

April 10, 1904, the very earliest lice are now hatching and accumulating upon the opening buds of the snowball.

April 15, 1902, lice hatching and accumulating on the opening buds.

May 7, 1903, lice beginning to curl the leaves. Largest leaves about 1 cm. long. Many *Syrphus*-fly eggs are being laid; largest lice now 1.80 mm. long, pale green in color, and covered with powder, no spines or tubercles.

May 18, 1908, Ft. Collins, stem-mothers and their young abundant in the curled leaves, the former all deep blue or greenish blue in color, and the nymphs apparently all becoming pupae, some of which seem fully grown.

June 13, 1901, many white larvae and pupae, and some alate females. Apparently all stem-mothers are still living.

June 13, 1901, the louse upon snowball bushes does not agree with Buckton's description of *Aphis viburni*.

June 30, 1908, Ft. Collins, can find no lice on any of the bushes where they were so abundant in May.

September 10, 1907, alate males, viviparous females and the white oviparous females all present on leaves of snowball now. Some of the oviparous females are nearly full grown.

September 15, 1908, Ft. Collins. Mr. L. C. Bragg tells me he found the first return migrants upon snowball leaves today.

September 22, 1900, alate females are giving birth to white larvae upon snowball leaves.

September 27, 1908, Ft. Collins. Mr. Bragg brought snowball leaves in the laboratory today, having males, viviparous females and the little white oviparous females upon them.

October 8, 1908, Denver, Colo., alate males and females and oviparous females are plentiful upon leaves of snowball in city park.

October 15, 1908, Ft. Collins, some of the oviparous females are now fully grown and laying eggs.

October 17, 1899, scattering specimens of alate viviparous females on snowball leaves now.

October 25, 1900, both males and oviparous females are upon the leaves and adult oviparous females are laying eggs.

Mr. J. T. Monell, to whom I am indebted for many valuable notes and suggestions in relation to plant louse studies, permits me to make the following extract from his letter to me dated February 3, 1909.

"I have examined the slide of the *Viburnum aphid* with much interest and thank you for it. I think you will be interested to know that I have found the same species here and that it shows the same tibial sensoria. \* \* \* I enclose brief notes which agree with your observations.

"*Aphis*, n. sp., 532, Apr. 24, '07.

"Cold backward spring. Stem-mothers with minute young, curling leaves into pseudo galls on snowball bush in my yard.

"Apr. 28, '07, green pulverulent stem-mother still present.

"May 10, '07, pupae and some winged lice in rolled leaves.

"May 11, '07, winged lice found but no apterous ones.

"Nothing further seen of the species though the bushes were frequently examined afterwards."

Mr. Monell also sent measurements of four antennae from spring migrants taken at St. Louis, Missouri, May 10, 1907, which are as follows :

JOINTS OF ANTENNAE IN MILLIMETERS.

THREE.	FOUR.	FIVE.	SIX.	SEVEN.
.399	.214	.185	.114	.385
.399	.214	.185	.114	.371
.385	.185	.171	.099	.357
.399	.199	.185	.099	.342

These notes upon the same species, from a distant point having a very different climate, are of special interest and tend to confirm the conclusions I had drawn in regard to the life habits of this louse, namely, that *Viburnum* is the over winter host plant, that the immediate young of the stem-mothers all acquire wings and leave the snowball bushes for other host plants, that the bushes are free from this louse from some time in June to September 1st, and that the alate males and viviparous females return to the snowballs in the months of September and October, the latter to deposit oviparous females, and the former to fertilize them.

The alternate food plant or plants I have not been able to find.

The most unique thing about this species is the presence of sensoria on the hind tibiae of the viviparous spring migrants; and it is quite usual, at least, for the second generation all to acquire wings in *Aphis* species.

EXPLANATION OF PLATE XI.

*Aphis viburnicola* n. sp.—1, young stem-mother a few hours after hatching; 2, old adult stem-mother with powdery secretion removed; 2a, antennae of adult stem-mother; 3, spring migrant; 3a, antenna; 3b, cornicle, and 3c, hind tibia of spring migrant, greatly enlarged; 4, fall migrant, female, and 4a, her antenna; 5, fall migrant, male, and 5a, antenna of the same; 6, adult oviparous female; 6a, young oviparous female; 6b, antenna; 6c, hind femur, and 6d, egg of adult oviparous female; 7, twig showing oviparous females and their eggs. Figures 2, 3, 4, 5, 6, 6a and 6d are enlarged 15 diameters; figure 1, 45 diameters; figures 2a, 3a, 3b, 3c, 4a, 5a, 6b and 6c, 60 diameters; and figure 7, 5 diameters. Drawings by M. A. Palmer.

NOTE.—The drawings in Plate VIII (March Number) of this volume were by Miss M. A. Palmer.



# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., JUNE, 1909.

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Upon careful estimation it was found that the total value of crops raised in the State of Pennsylvania during the year 1908 amounted in value to over one hundred and seventy million dollars (\$170,415,840). This was for barley, buckwheat, corn, hay, oats, potatoes, rye, tobacco, and wheat. The value from fruit culture, flowering plants, trees and shrubs we do not know. It has been estimated that insects take a toll of one-tenth, and on this basis the amount of money loss on the crops alone would be nearly nineteen millions of dollars in this one State. The value of economic work in entomology is rapidly becoming appreciated in Pennsylvania, and in fact all over the United States, but there is much to be desired. One thing that Pennsylvania needs is a list of its species of insects similar to the admirable one gotten out by Prof. John B. Smith, State Entomologist of New Jersey. Such a list would be a great aid and stimulus to entomologists and would encourage the non-professional collector. The New Jersey list has been a great stimulus and in time many States will publish lists of insects. Irrespective of value in economic work, geographical distribution and the other scientific studies are advanced by such compilations.

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THE associate editor of the NEWS, Dr. Philip P. Calvert, has been granted leave of absence until October 1, 1910, by the University of Pennsylvania, where he is Assistant Professor of Zoology, to enable him to go to Central America to pursue further researches on the ecology of tropical Odonata. This is in continuation of the studies which have grown out of his preparation of the account of these insects for the "Biologia Centrali-Americana." Dr. and Mrs. Calvert sailed from New York on April 17 for Costa Rica. Their permanent address is 635 North Sixteenth Street, Philadelphia, Pa.

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

PROF. LEVI W. MENGEL, the well-known lepiopterist of Reading, Pennsylvania, has been abroad for a number of months and has traveled up the Nile, visited Palestine and other places of interest. At present he is inspecting the various museums in western Europe.

ONE of the Cornell entomologists who is rapidly winning a reputation in his chosen field is Charles W. Howard, A. B., 1904. On completing his undergraduate work here, he remained as a laboratory assistant, in the department of Entomology for a part of the following year and, early in 1905, went to Pretoria as Assistant Entomologist to the Transvaal Department of Agriculture. On the death of C. B. Simpson, B.S.A., 1899, he became Government Entomologist to the Transvaal. Recently he has transferred to Portuguese East Africa in a similar position.

Aside from the educational work which must accompany the introduction of modern American methods of Economic Entomology into a conservative colony, Mr. Howard's main work will be in studying and combatting insect transmitters of disease and in the fight against the locust plague.

Something of the extent of the latter may be seen from the fact that, in a single district of the colony, the locusts last year damaged the cocoanut crop alone to the extent of \$360,000. On a big sugar plantation along the Zambezi River there have just been dug from among the canes, over an area of 2000 hectares, more than *fourteen tons* of locust eggs. In addition to this method of destroying the pest, oil was being spread along all the roadways and other areas where the young grasshoppers were hatching out. Mr. Howard has organized, in connection with this work, a system for collecting information which, during the year, should give much reliable data as a basis for the fight in the future.

In a recent letter, he writes that he is somewhat handicapped by lack of proper equipment, but that the work is being very liberally supported, and that as fast as he can collect apparatus, he will be able to obtain it. It is hard for us to realize what it means for so conservative a government to take the radical step of establishing and actively supporting such a department, and it may well be seen that the work will call for the exercise of the greatest tact and ability in handling men as well as demanding a knowledge of technical entomology. Mr. Howard's success in the past few years bespeaks an equally successful experience in his new field and his work will be watched with interest by his Cornell friends.—*Cornell Countryman*.

## Doings of Societies.

The Entomological Society of Western Pennsylvania held its annual meeting at the Carnegie Museum on the evening of Monday, April 5. Officers were elected as follows: *President*, Dr. W. J. Holland; *Vice-President*, Henry Engel; *Secretary* and *Treasurer*, F. W. Friday.

The society formally tendered its thanks to Mr. Engel for the preparation of the list of the Lepidoptera of the region, which has recently been published, Mr. Engel having assumed the greater portion of the work which had been entrusted to a committee of which he was one of the members.

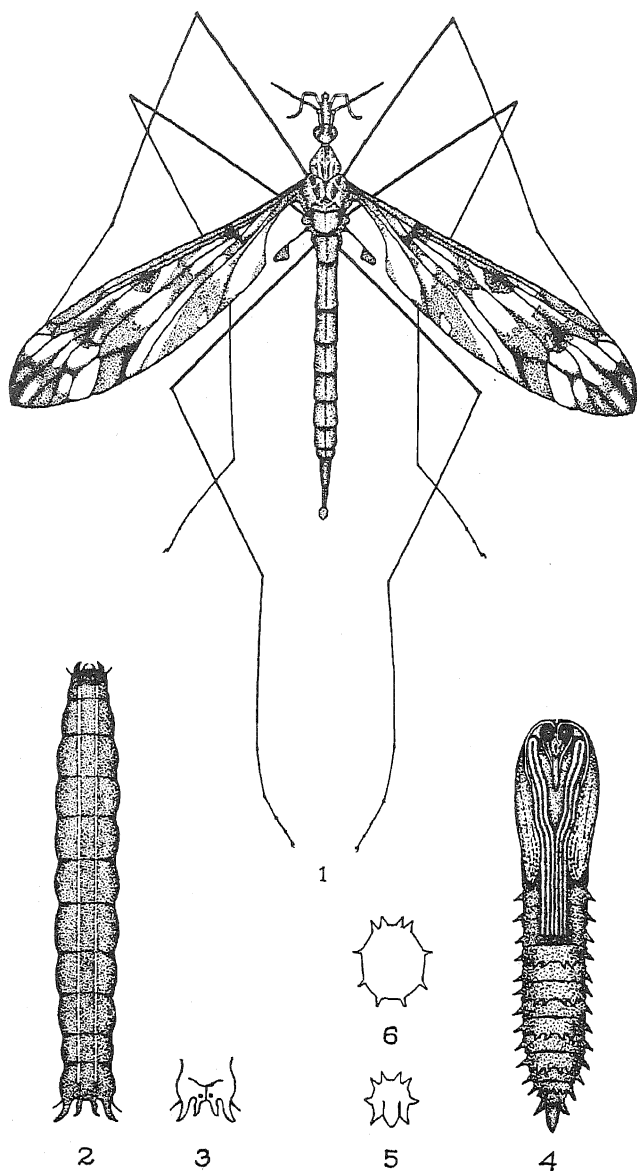
Plans for the vigorous prosecution of the general work of exploring the upper valley of the Ohio were considered. Mr. Hugo Kahl reported that he has in hand and he will shortly have ready for publication a preliminary list of the Diptera of the region.

The society inspected the new galleries and cabinets which are in process of erection in the laboratory of entomology in the Carnegie Museum, and which, when completed, will furnish accommodation for over a million and a half of insects properly labeled and displayed. The galleries are built of steel; the cabinets, which are being made in the shops of the Carnegie Museum, carry each one hundred and eighty drawers on the first floor of the gallery and one hundred and eighty drawers on the second floor. There are twenty of these cabinets, and there will thus be seven thousand two hundred drawers 18 inches wide, 24 inches deep, and  $2\frac{1}{2}$  inches high, lined with cork and made as nearly as it is possible to make such things dust and pest proof.

Dr. Holland displayed a collection of Heterocera which had just been received from Eastern Bolivia, from one of the collectors of the Museum, numbering about two thousand specimens. The extreme beauty and perfection of the specimens was commented upon by the members of the society.

F. W. FRIDAY, *Secretary*.





GREENE ON *TIPULA TRIVITTATA* SAY.

# ENTOMOLOGICAL NEWS

AND  
PROCEEDINGS OF THE ENTOMOLOGICAL SECTION  
ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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## Description of Larva and Pupa of *Tipula trivittata* Say.

BY CHAS. T. GREENE, Philadelphia, Pa.

(Plate XII)

While collecting in a stump of oak at Glenside, Pa., March 30, 1908, I found two dipterous larvae about an inch or two beneath the bark, where the decayed wood was soft and damp.

The larva, Fig. 2, was about 32 mm. long when fully extended and translucent, yellowish brown in color and with two longitudinal white stripes on the dorsal side. The head, mandibles and antennae were black.

By carefully watching the larva I made the following observations: It moved by expanding and contracting the body and propelling itself by the ventral side of the last segment. The last segment had four appendages, the two larger ones being slightly above the smaller pair, but as the larva moved it kept all four entirely free from the surface on which it moved.

Fig. 3 is a ventral view of the last segment.

The larva pupated between April 15-17, 1908 in the decayed wood.

The pupa, Fig. 4, is 22 mm. long, chestnut-brown in color; being lighter towards the anterior end.

Fig. 4 is the ventral view of the pupa and the location of the two pairs of spurs. Fig. 5 is a view looking at the posterior end of the pupa. Fig. 6 is a section taken just below the centre of the pupa and gives the position of the spurlike appendages around the pupa-case.

After lying in the pupa state until April 25, 1908, the pupa worked its way to the surface during the night and about half its length protruded.

The next morning (April 26, 1908) the imago appeared.

The other larva found with this one described was slightly smaller and black from the head to a little above the middle of the body. Otherwise like the above. These are the two specimens mentioned in ENT. NEWS—Vol. xx, page 134.

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## Descriptions of New Hymenoptera.

By H. L. VIERECK.

### *Helorimorpha fisheri* n. sp.

♀.—Compared with the description of *melanderi*\* this species differs as follows: Head including the scape concolorous with the thorax excepting the space between the ocelli and the border around the latter and the eyes, all of which are more or less black, pedicel brownish, flagel black, ocelli not bordered by a raised line, maxillary palpi five-jointed; thorax more or less reticulated all over, tips of posterior tibiae and their tarsi dark-brownish, wings smoky, the stigma and veins concolorous dark-brown, almost blackish; the transverse median vein of the front wings failing to join the sub-median vein on account of a hyaline streak, the latter vein near its middle with a brown streak perpendicular to it and extending to the posterior margin of the wing; apical half of abdominal petiole parallel sided and inserted into the second dorsal abdominal segment into what seems to be a quadrate socket, the petiole apparently perfectly smooth and polished above.

♂.—Essentially the same as the ♀, but lacking the brown streak in the anal cell.

Type No. 12283 U. S. National Museum.

Type locality Plummer's Island, Md., August 18, 1907, col-

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\* 1908 ENT. NEWS, XIX, pp. 363 and 364.

lected by A. K. Fisher, July 7, 1907 collected by W. L. McAtee. Two paratopotypes collected by W. L. McAtee and D. H. Clemens, August 24, 1907, June 13, 1905, respectively. Two paratypes collected by N. Banks at Great Falls, Va., June 27 and Falls Church, Va.

**Pimpla (Pimpla) erythropus** n. sp.

Female, 10 mm.; male, 8.5 mm.; female, paratopotype, 12 mm., paratypes, 10.5 to 12.5 mm. Differs from *sanguinipes* in having a more or less smooth polished area occupying most of the posterior face of the metathorax, this space being bounded by a more or less distinct semi-circular carina, the carina distinct at least laterally; membranous portion of male wings almost hyaline, the same portion of female wings distinctly brownish.

Type No. 12276, U. S. National Museum.

Type locality, Sommerdale, Calif. (Hopk. U. S. 4449E5, 4449E6, 4449E, 4449E3), (H. E. Burke), 1 ♀ paratopotype, 1 ♂ paratopotype.

Other localities, Los Angeles Co., Calif. (Aug. Keble 85E); Alameda Co., Calif., Sta. Monica, Calif., June 6, 1901 (C. E. Hutchinson), 3 ♀ paratypes 1 ♂ paratype.

**Pimpla (Epiurus) brunneifrons** n. sp.

Differs from *inquisitoriella* in the face of the male being brown beneath the antennae, in the reticulate pleural sides of the female propodeum and in both sexes having the longitudinal carinae of the metanotum more pronounced and more elevated buttress-like.

Type No. 12273, U. S. National Museum, 4 females and 3 males, all from the type locality.

Type locality, Summerdale, Calif. (Hopk. U. S. 4449i). Reared from *Netolophus oslari* (H. E. Burke).

**Cryptus (Gambrus) burkei** n. sp.

Transverse median vein in anterior wings inserted as in *Trychosis* female, 7 mm. Differs from *nuncius* also as follows: Antennae 27-jointed, entirely black; coxae and first joint of trochanters of anterior legs entirely black, coxae and trochanters of middle and posterior legs entirely ferruginous, elevated lines of metathorax very indistinct, posterior femora and tibiae tipped with fuscous, their tarsi a kind of testaceous, infuscated toward tips; second dorsal abdominal segment with very indistinct punctures, first dorsal segment with the constricted



portion black, fourth and following dorsal segments black, ovipositor protruding beyond the tip of the abdomen to a distance equal to about one-half the length of the latter. Three female paratopotypes, one with fourth dorsal abdominal segment partly reddish laterally, a fourth female paratopotype about 4 mm. long. Male, 5 mm.; antennae 28-jointed; all coxae and first joint of trochanter of all legs black, the latter at least mostly so, second, third and fourth tarsal joints of hind legs pale, whitish, fifth dorsal abdominal segment black except at base, sixth and following dorsal segments also black; 2 male paratopotypes, one of which is about 3.5 mm. long, has the fifth and following dorsal abdominal segments black and the hind tarsi fuscous, except the third and fourth joints, which are partly pale.

Types No. 12282, U. S. National Museum.

Type locality, Summerdale, Calif., Hopk. U. S. 4430b2, 4430b, 4430b1.

*Abics concolor* (H. E. Burke, reared), Hopk. U. S. 4449h, 4449b, September 8, 1906, on tent (H. E. Burke).

***Sphecodes* (*Sphecodes*) *macfarlandi* n. sp.**

Female.—9 mm. Differs from *latus*\* apparently only as follows: Tegulae testaceous anteriorly, blackish posteriorly, dorsal abdominal segments with impunctate apical borders, red of abdomen very dark, blackish.

Type No. 12276 U. S. National Museum.

Type locality, Nelson, New Hampshire, one specimen (collected by Prof. Joseph McFarland).

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I HAVE RECENTLY been making some exchanges in Lepidoptera with American correspondents and have just had a trying experience. I sent a couple of boxes of insects to a friend by post, but the postal authorities refused to deliver unless *duty* was paid, and this was not unnaturally declined, and in the end the parcel having been opened was returned to me, on which I had to pay a re-direction fee amounting to more than the original postage. But the evil of it all lies in the fact that it was most carelessly packed and that in a large box of butterflies there is not a single specimen undamaged, nearly all of them being completely smashed. They were rare exotic butterflies, many from remote parts, most difficult to obtain. Is there no remedy to be obtained in a case like this? Yours faithfully, G. T. BETHUNE-BAKER, Edgbaston, England.

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\* As described by Lovell, 1907 *Psyche* (101-104).

## A Case of Replacement of Color in *Papilio ajax* Linn.

WILLIAM W. NEWCOMB, M. D., Detroit, Mich.

An interesting example of replacement of color occurred in the course of an experiment to determine the effect, if any, of different colors upon the growing larvae and the chrysalids of *Papilio ajax*. One of the latter, instead of producing the usual summer form of the species (*marcellus*) with the vivid crimson markings, disclosed an imago in which these were all replaced by yellow. The difference is very striking especially when a specimen of the normal form and the one under consideration are directly compared, the crimson stripe and the two spots of the crimson bar of the under surface of the hind wing of the one contrasting strongly with the yellow of the corresponding parts of the other; the antennal spot on the upper surface is only less conspicuous because of the single spot. This unique specimen is a male which emerged September 3, 1906.

It may be worth while to note the conditions under which the replacement occurred. I was engaged in rearing a considerable number of larvae of *ajax* from eggs of imago, in each experiment subjected to the influence of the same color throughout their lives. Breeding boxes were used in which the inside in each case was entirely of the one color including the material to close the openings for the admittance of light and air. The specimen showing the replacement came from the box in which the lining color was maroon and was the only butterfly that emerged from this box in the summer or fall, all the others—some twenty-two in number—passing the winter in the chrysalis and hatching in the spring without any change from the normal in regard to the crimson color.

Why should a single specimen have shown this variation of color, notwithstanding the fact that all the larvæ and chrysalids were kept under the very same conditions? Unfortunately only one butterfly was disclosed in the fall of the year; the length of time in the chrysalis then, may perhaps be considered as a different factor, but it is, however, the only one. Had a second specimen showing the replacement emerged in

the fall, the influence of the particular color under which the larvæ and pupæ were raised would be very suggestive of the cause of the condition.

Folsom\* in discussing the replacement of red by yellow in certain insects says, "These two colors in many butterflies and beetles are due to pigments that are closely related to each other chemically" and "Yellow in place of red then may be attributed to an arrested development of pigment in the living insect." Just what causes this arrest it seems is not very well known, but Folsom gives a hint in this sentence, "These changes of color are apparently of no use to the insect, being merely incidental effects of light, temperature or other inorganic influences." The light or color factor may therefore have more influence than appears at present and further experiments along this line should prove instructive one way or the other.

I believe that replacement of color in the Rhopalocera is of very rare occurrence. This is the only example I have ever seen out of many thousands of butterflies of my own and of others collecting. In the work referred to above, Folsom mentions only one species of butterfly by name, "*Vanessa (Pyrameis) atalanta*," in which replacement occurs.

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### Incidental Captures of Apterous and Orthopterous Insects at Plano, Texas.

By E. S. TUCKER, Bureau of Entomology, U. S. Department of Agriculture.

A list of the orthopterous insects collected by myself while stationed at Plano, Collin County, Texas, from May to December, 1907, does not afford a proper indication of the number of species that might be expected to occur in the locality, since only incidental attention could be given towards collecting. However, as the common kinds were fairly represented in my collection, the species attract special interest

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\*Entomology: With Special Reference to its Biological and Economic Aspects, by Justus W. Folsom, pages 214-215.

from an economic standpoint, and are cited mainly on this account for the sake of the records in a locality which is typical of the black prairie lands of Northern Texas. The publication of new local records of any species, even should it be a common insect, contributes towards a better knowledge of distribution, and especially with reference to Texas, offers available data of definite captures for use in the prospective event of a general state list.

So far as was possible under the circumstances attending the study of the specimens, the specific determinations were made by myself; otherwise, the orthopterous insects were submitted to Mr. A. N. Caudell, of the U. S. National Museum, who kindly completed the work of identification. Special credit is given for the determination of the species of *Collembola*.

#### SUMMARY OF FAMILIES AND SPECIES, INCLUDING TWO VARIETIES.

Lepismidae.....	1	Mantidae.....	2	Blattidae.....	4
Sminthuridae...	1	Phasmidae.....	1	Locustidae.....	6
Forficulidae.....	1	Acridiidae.....	17	Gryllidae.....	7
Total number of forms reported, 40.					

#### Order THYSANURA.

##### Family LEPISMIDAE.

*Lepisma saccharina* L.—August, occasionally in house, but also under shelter in yard.

#### Order COLLEMBOLA.

##### Family SMINTHURIDAE.

*Sminthurus packardi* Folsom.—July, in soil from corn field used for potting purposes; six specimens captured. Examples were determined by Dr. J. W. Folsom, the describer of the species. (See *Psyche*, Vol. VII, p. 385), who stated that the types came from Waco, Texas.

Order **EUPLEXOPTERA.**Family **FORFICULIDAE.**

*Labia minor* L.—July to September, all at night taken at trap light.

Order **ORTHOPTERA.**Family **BLATTIDAE.**

*Thyrsocera cincta* Burm.—July.

*Ischnoptera inaequalis* S. and Z.—June, in house; July; July, in house; July, at night detected with light of lantern on log; September; September, in house.

*Ischnoptera uhleriana* Sauss.—July; July, at night detected with light of lantern on log, and taken at trap light; November, in house.

*Blattella germanica* L.—May, nymph in house.

Family **MANTIDAE.**

*Stagmomantis carolina* L.—August and September, at night taken at trap light; September, at random.

*Oligonyx scudderi* Sauss.—September and October, all at night taken at trap light.

Family **PHASMIDAE.**

*Diapheromera femorata* Say.—June; July, August.

Family **ACRIDIIDAE.**

*Tettix arenosus* Burm.—May, at dusk in oat field.

*Paratettix cucullatus* Burm.—August.

*Tettigidea lateralis* Say.—August; October.

*Tettigidea lateralis* Say, var. *polymorpha* Burm.—August.

*Syrbula admirabilis* Uhl.—July, at night taken at trap light; August; October.

*Orphulella picturata* Scud.—September.

*Boöpedon nubilum* Say.—August.

*Arphia luteola* Scud.—August.

*Chortophaga viridifasciata* DeG.—July; July, in oat stubble; August.

*Encoptolophus parvus* Scud.—August; October; November.

*Dissosteira carolina* L.—November.

*Schistocerca americana* Dru.—July; August; August, at night taken at trap light; September, twilight; December, at night taken at trap light.

*Campylacantha acutipennis* Scud.—November.

*Melanoplus differentialis* Uhl.—November.

*Melanoplus plebejus* Stal.—November.

*Melanoplus robustus* Scud.—August; October; November.

*Melanoplus scudderi* Uhl., var. *texensis* Hart.—August.

#### Family LOCUSTIDAE.

*Scudderia texensis* S. and P.—October.

*Amblycorypha uhleri* Stahl.—July, twilight.

*Orchelimum glaberrimum* Burm.—August; October.

*Xiphidium fasciatum* DeG.—July, at night sweeping; October; November.

*Xiphidium strictum* Scud.—July to October. This species was frequently found during August to be preyed upon by a robber fly known as *Stenopogon longulus* Lw.

*Ceuthophilus sallei* Scud.—July, at night detected with light of lantern at rotten logs; August, October and November, under boards and rubbish.

#### Family GRYLLIDAE.

*Ellipes minutus* Scud.—August.

*Nemobius cubensis* Sauss.—August and September, at night taken at trap light.

*Nemobius fasciatus* DeG.—October.

*Gryllus pennsylvanicus* Burm.—August; September. The long-winged form was collected in August, at night taken at trap light, in addition to captures during daytime in August and September.

*Oecanthus angustipennis* Fitch.—August.

*Oecanthus fasciatus* Fitch.—July, at night sweeping; October, twilight.

*Oecanthus nigricornis* Wk., (*quadripunctatus* Beut.)—November.

## Notes on Wood-Boring Coleoptera.

C. A. FROST, South Framingham, Mass.

In the April number of the NEWS, p. 188, I noticed a brief reference to the penetrating powers of some species of Scolytidae which when pursued bored "into the heart of the tree so rapidly as to almost defy capture." This brought to mind some notes made several years ago from observations on another family of similar habits. I had found a species of *Hadrobregmus*, probably *carinatus*, boring into sticks of stove-wood which were seasoning in the yard. The wood was neither very green nor well seasoned, and, I think, had been cut the previous winter. It was attacked on the split surfaces where they were uppermost.

As the rate of progress into the wood seemed rather slow, I selected a stick of white maple, one of hornbeam, and one of beech, on each of which a beetle was working, and laid them aside for observation at 3 P. M. (June 20th). At 7 P. M. no perceptible advance could be detected, all being sunk in the wood to the hind coxae. At 7 A. M. the next morning the one in the maple stick was in its entire length, while the one in the beech had the last segment of the abdomen protruding; the one in the hornbeam was not working. On June 22, at the end of forty-three hours, the one in the maple stick had bored into the wood one mm. more than the length of its body. Allowing for an extremely long specimen of this species the rate of progress for the forty-three hours was three and one-half mm. The one in the beech stick was in the exact length of its body, or five mm. The one in the hornbeam was dead. No post mortem examination was made but I have concluded that it died of exhaustion or disgust at the tough proposition that confronted it.

While the insect is at work the body is swung from side to side in a partial rotation and the cuttings come up in small lunate segments which are pushed back by the hind legs. At intervals the beetle backs partly out and pushes away the accumulated debris with the posterior tarsi.

This species was very abundant in the woodshed of the old farmhouse where I was spending my vacation and the timbers were fast assuming a serious condition of "powder-post" from their operations. The sticks of beech wood in the shed, which had evidently been piled up for several years in the back tiers, were almost reduced to powder in many cases. In the pine flooring of the attic some species of insect was also working and throwing up a very fine mealy dust into little piles, sometimes a quarter of an inch or more in height. These may have been the larvae of the same species as adult specimens were found in spider webs and on the windows of the attic.

In view of the great difference in the rate of progress between these specimens of *Hadrobregmus* and the unspecified Scolytid mentioned in the note referred to, I have concluded that they must represent the tortoise and the hare of the wood-boring Coleoptera.

I am wondering what becomes of the debris that the pursued Scolytid dislodges.

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### New Species of West Indian Cecidomyiidae.

By E. P. FELT, Albany, N. Y.

The following descriptions are based on material reared or collected and kindly submitted for study by Prof. H. A. Ballou, Government Entomologist of the British West Indies.

#### *Asynapta mangiferae* n. sp.

This species was reared from maggots found under the bark of small twigs of grafted mango, probably *Mangifera indica*. The presence of the larva is not indicated by an external swelling.

*Male*.—Length 1.5 mm.—Antennae as long as the body, sparsely haired, fuscous yellowish; 23 segments, the fifth with a stem three-quarters the length of the cylindric basal enlargement, which latter has a length twice its diameter, the subbasal whorl thick, short, subapical band rather broad, thick, long; circumfili at the basal third and apically; terminal segment somewhat produced, obconic, tapering to a narrowly rounded apex. Palpi; first segment with a length three times its diameter, the second one-half longer, the third one-half longer than



the second, and the fourth as long as the third, all very thickly haired. Mesonotum probably fuscous yellowish. Abdomen presumably yellowish orange; genitalia yellowish. Wings hyaline, costa uniting with costa at the basal third, the third vein a little beyond the apex, the fifth at the distal fourth, the sixth near the basal half. Halteres whitish transparent. Legs probably pale yellowish; claws moderately stout, strongly curved, unidentate, the pulvilli shorter than the claws. Genitalia; basal clasp segment stout, obliquely truncate, the internal distal angle distinctly produced, setose; terminal clasp segment stout, somewhat swollen apically and with a relatively slender, chitinous tooth on the broadly rounded apex; dorsal plate long, deeply and narrowly incised, the lobes narrowly rounded, sparsely setose; ventral plate long, broadly and roundly emarginate, the lobes broadly rounded, thickly setose. Harpes heavily chitinized, slender, irregularly curved, acute apically.

*Female*.—Length 1.5 mm.—Antennae extending to the third abdominal segment, rather thickly haired, apparently yellowish brown; 23 sub sessile segments, the fifth obconic, with a length three-quarters its diameter, subbasal whorl thick, stout, subapical whorl sparse; terminal segment produced, with a distinct knob apically. Mesonotum probably yellowish brown. Scutellum and postscutellum presumably yellowish. Abdomen probably yellowish orange; ovipositor yellowish. Halteres yellowish transparent. Legs a nearly uniform pale straw; claws stout, strongly curved, unidentate, the pulvilli longer than the claws. Ovipositor one-half the length of the abdomen, the lobes consisting of a stout basal subquadrate segment, with a narrowly oval apical one, both sparsely setose.

Type Cecid. a 1955 N. Y. State Museum.

***Asphondylia attenuatata* n. sp.**

This species was reared in some numbers from flower buds and flowers of privet or wild coffee, probably *Faramaea odoratissima*. The male is peculiar on account of the slender, somewhat produced antennae, the flagellate segments being provided with unusually small and indistinct circumfili.

*Male*.—Length 2 mm.—Antennae nearly as long as the body, sparsely haired, presumably fuscous yellowish; 14 sessile segments, the fifth with a length fully six times its diameter and uniformly clothed with short setae, the sparse subbasal whorl being absent and the tortuous, slightly elevated circumfili very indistinct; terminal segment hardly reduced and tapering slightly to a broadly rounded apex. Palpi; first segment stout, with a length three times its diameter, the second a little longer, slender. Mesonotum dark brown. Scutellum and post-

scutellum fuscous yellowish. Abdomen brown; genitalia fuscous yellowish. Wings hyaline, costa pale straw, subcosta uniting therewith before the basal half, the third vein at the apex, the fifth near the distal fourth, its branch near the basal third. Halteres yellowish basally fuscous apically. Coxae fuscous yellowish. Legs a pale straw; claws stout, strongly curved, simple, the pulvilli longer than the claws. Genitalia; basal clasp segment short, stout; terminal clasp segment short, swollen, apical tooth bidentate; dorsal plate short, deeply and triangularly incised, the lobes angulate, sparsely setose. Other structures indistinct.

Type Cecid. a 1957 N. Y. State Museum.

***Lobodiplosis spinosa* n. sp.**

This remarkable fly was taken at light, St. Johns, Antigua, in January, 1909. The male is easily recognized by the greatly produced genitalia, the peculiar spinose setae of the basal clasp segment and the heavy, chitinous spines of the harpes. The female, apparently taken in some numbers, is provisionally associated with the male on account of the two being captured together.

*Male*.—Length 1.5 mm.—Antennae probably one-half longer than the body, thickly haired, fuscous yellowish; 14 segments, the fifth having the basal stem with a length two and a half times its diameter, the distal stem with a length three times its diameter, the basal enlargement subglobose, subbasal whorl thick, the circumfili short, extending to the middle of the stem, the distal enlargement produced, with a length two and a half times its greatest diameter, constricted near the basal third, the basal circumfilum short, the loops extending to the middle of the enlargement, the distal circumfilum rather short, the loops extending to the apex of the enlargement; subapical whorl rather thick, long. Palpi; the first segment presumably short, stout, the second with a length four times its diameter, the third as long as the second, the fourth one-quarter longer and more slender. Mesonotum apparently fuscous yellowish. Scutellum, postscutellum and abdomen probably yellowish. Wings hyaline, subcosta uniting with costa at the basal third, the third vein at the apex, the fifth at the distal fourth, its branch near the basal half. Halteres pale yellowish. Legs yellowish straw; claws rather stout, strongly curved, the anterior unidentate. Genitalia; basal clasp segment long, very slender, slightly expanded apically and with a distinct rounded lobe, the tip of the segment and the lobe thickly clothed with long, stout, spine-like setae; terminal clasp segment subapical, long, slender, slightly curved; dorsal and ventral plates indistinct. Harpes long, chitinized, with a pair of

heavy, curved spines basally and a much larger, more strongly curved pair near the distal third.

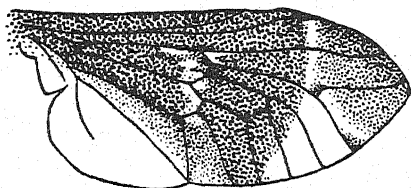
*Female*.—Length 1.5 mm. —Antennae extending to the third abdominal segment, sparsely haired, fuscous yellowish; 14 cylindric subsessile segments, the fifth with a stem one-quarter the length of the basal enlargement, which latter has a length two and a half times its diameter; subbasal whorl sparse, stout; subapical band thick, broad; terminal segment produced, with a length six times its diameter and tapering nearly uniformly to a subacute apex. Palpi; first segment somewhat produced, narrowly oval, the second one-half longer, slender, the third shorter and broader than the second, the fourth longer, a little broader than the third. Mesonotum fuscous yellowish. Scutellum and postscutellum yellowish. Abdomen reddish; ovipositor yellowish. Halteres pale yellowish. Legs a pale straw. Ovipositor short, the terminal lobes long, narrowly lanceolate, slightly dilated apically, sparsely setose.

Type Cecid. a 1956 N. Y. State Museum.

### Male of *Chrysops brimleyi* Hine.

By CHAS. T. GREENE, Philadelphia, Pa.

Like the female, except basal half of the antennae clothed with long black hair. Frontal triangle gray pollinose, with the apex shining black. Thorax black, clothed with black hair, no stripes visible. The abdomen black, with the posterior margins of all the segments, except the first, gray pollinose. The wings differ from the female in having the basal end of the black cross-band reaching slightly beyond the middle of the anal cell. The first basal cell has two hyaline spots near the apex, and the second basal cell, one. First submarginal cell with



a hyaline spot at the base. The discal cell has a hyaline spot at the base, the fifth posterior cell has a semihyaline spot at the base and one at the apex. The apical spot reaches downward over the upper end of the marginal cell, covering about half the first submarginal and nearly all the second submarginal cell. A small black spot at the apex of the posterior branch of the third vein.

Length about 8 mm.

A single specimen taken at Glassboro, N. J., May 19, 1907, by the writer. The females were very common.

(For description of other sex, see Can. Ent., page 55, 1904.)

## Packing Butterflies and Moths for Shipment.

By WM. J. GERHARD, Chicago, Ill.

Although nearly every person interested in entomology occasionally finds it necessary to prepare insects for shipment, nevertheless a considerable lack of appreciation of the protection the material requires is still quite frequently apparent. Even when only a limited number of specimens must be conveyed for some distance, a certain amount of care in preparing them for this purpose is very essential. Much more important, however, do the requirements for packing insects become, when an entire collection must be moved from one section of the country to another.

This phase of entomological technique has not been ignored in previous volumes of the *News*. It will, therefore, not be an innovation, and may prove of some interest, to give a brief account of the method used, when packing and shipping the large and valuable collection of butterflies and moths, made by the late Dr. Herman Strecker of Reading, Pa., and recently acquired by the Field Museum of Natural History of Chicago. The customary way of protecting insects against injury while being transported having proved quite satisfactory on former occasions, practically no departure was made from the usual manner of preparing them for shipment. The following account, therefore, merely illustrates the safety with which an extensive collection of butterflies and moths can be moved from one city to another.

A large amount of work of a preparatory nature was, of course, necessary before any of the material could be packed. The first step in the desired direction was to number the cabinets and all of the drawers, so that the original order of their arrangement could easily be maintained. But much more essential was it to preserve the original arrangement of the specimens in the drawers. Hence even if the size of the collection would not have made it an almost impossible task, it would not have been well to disturb the specimens by transferring them into cotton lined drawers, or to arrange them shingle-like, as is frequently done with small lots of similar insects.

Although it was neither desirable nor practical to condense the material in any of the drawers, excepting a few which contained duplicates, other protective measures were still available.

To lessen the possibility of an insect becoming loose and rolling around, while the drawer was being handled, every pin was tested and forced more deeply into the cork or wood, whenever it was considered necessary. A surprisingly large number of pins had to be made more secure in this manner. Since many of the drawers contained no cork, and in as much as all of the specimens were mounted on brass pins, this work demanded the almost constant use of the pinning forceps, as well as a great deal of care.

The next procedure was to find those specimens that were loose on their supports. They were easily detected by touching each insect lightly and carefully with a pin. Those that were not held firmly were made secure by means of a pin inserted on each side of the body of the insect. When this method was not possible, the desired stability was obtained by placing pins in front of the costal edge of the forewings. As an additional precautionary measure, the bodies of all the large species were protected in the above manner, even though they showed no tendency to turn on their pins. Broken specimens were either mended or in some other way secured from further injury, and a few of the very large species were shelved, that is, their wings were supported by strips of cardboard.

How to protect the insects so that there would be only a minimum amount of damage, were the glass in the covers of the drawers to break while being handled, was also a problem that deserved some attention. Paper pasted to the surface of the glass no doubt would afford some protection, and on the strength of this supposition about 80 drawers were treated in this manner, the form of their covers permitting no other way of using the paper. But fortunately a suggestion kindly given by Dr. Skinner was found to be much more practical, namely, to place a sheet of thin, strong paper over the drawer before replacing the cover. In this way the contents of over

700 drawers were covered, with but little loss of time either in placing the paper in position or in removing it when the collection was unpacked. The utility of the presence of the paper, however, still remains to be ascertained, but, in as much as it prevented a lot of crumbling putty from falling on the specimens, it seems reasonable to suppose that it would also have afforded some protection, if the glass in some of the covers had broken. In examining and protecting in the above manner all of the material in the collection, over three weeks were consumed by the writer, Mr. E. L. Hettinger also kindly giving some assistance. It was not until this preliminary work had been completed that the packing was started.

Six of the small-sized drawers, five of the larger ones, were placed one above the other, the glass of the top drawer being protected by a covering made of boards five-eighths of an inch in thickness. Each one of those tiers was wrapped in strong, heavy paper, securely tied, numbered, and then set aside. When all of the drawers had been removed from a cabinet, it was taken apart and its sections were lowered to the basement, where all of the books and correspondence had already been taken, in order to obtain sufficient space in the room to pack and store the insects.

For each tier of drawers a durable shipping-case was used. The dimensions of the box exceeded the size of the package of drawers by at least four inches in every direction. This intervening space was filled with either hand or machine picked excelsior, care being taken to pack it neither too loosely nor too tightly. In as much as the weight of the drawers would compress the excelsior to some degree and thereby lessen its utility, a little more of the packing material was put in the bottom of the box than in the top. Even though the insects were packed in excelsior, jarring the shipping-case was to be avoided as much as possible, and for this reason the lid was fastened by means of screws. The shipping tags and the fragile-labels were likewise attached to the lid before it was screwed on the box.

On account of the inconvenience of using the narrow stair-

way leading to the third story room in which the collection was contained, everything was carried to one of the windows and lowered to the ground by means of a block and tackle. This proved to be a safe and satisfactory way of handling the material. Some idea of the amount of work necessary to ship this collection can be had by stating that 15 bales of excelsior were needed to pack the insects and that 139 shipping-cases were required for the drawers, besides the boxes used for the books and correspondence. The weight of the packed insects was over 14,000 lbs., the books, cabinets, etc., over 5000 lbs. Throughout all of the packing, lowering to the ground, loading on the van and placing in the car, the fragile nature of the material was constantly impressed upon the men who were doing this part of the work.

On placing the collection in the freight car no attempt was made to protect the insects from the vibration and jarring to which they would be subjected; the only precaution taken was to arrange the boxes, right-side-up, in such a way that there could be no lateral motion. To prevent them from shifting backward and forward, heavy braces were fastened to the interior of the car. Since insects, which are classified as stuffed animals, are scheduled at three times the regular first class rate, it is not surprising, perhaps, that the railroad officials were inclined to display some interest in the shipment. As a result of this interest, the fragile nature of the shipment was indicated by means of signs, and special instructions were given to the trainmen at both ends of the line, the car thereby no doubt escaping much rough handling. Naturally the collection was insured against loss by fire, collision or derailment while on the car.

During the work of transferring the collection from the car to the Museum, the order of the day again was—Care; from the beginning to the end it was the watch-word. Perhaps to it was due to a considerable extent the very satisfactory condition of the material, when it was finally unpacked.

How needless was the fear or doubt concerning the safe arrival of the collection! Not one of the 800 glass covers was

broken; but one insect, a duplicate moth, was loose in all of the drawers. Despite the frequent handling and the 900 mile ride to which the insects were subjected, the only signs to indicate that the collection had ever been moved, were five or six detached bodies and here and there a broken antenna. Considering the number of specimens, at least 50,000, and the age of some of them, the results certainly demonstrate the efficiency of the above method of packing butterflies and moths for shipment.

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## An Illustrated Glossary of Chaetotaxy and Anatomical Terms Used in Describing Diptera.

By W. R. WALTON, Harrisburg, Pa.

(Plates XIII, XIV, XV, XVI)

These plates and the accompanying glossary are presented by the author with the sincere hope that they may prove of material assistance to workers in dipterology, especially beginners, many of whom have, no doubt, been dismayed at the formidable array of technical terms which confront one who attempts to make use of the writings of the various describers for purposes of classification.

Most of the older works on this subject are out of print and inaccessible except to the lucky few; others are scattered through various volumes of periodical publications and are troublesome to collate.

Some of the more recent works on classification contain glossaries more or less complete, but none of them is fully illustrated.

In treating a subject so dry and complicated as the one in hand, too many illustrations cannot be used. The mind must be afforded the opportunity of visualizing, else confusion is sure to exist and a clear comprehension of the subject becomes well nigh impossible. Then too, most of the plates hitherto introduced are arranged upon the old plan of numbering or lettering the parts shown. Rarely the explanations regarding the same are to be found on the same page with the illustra-



tions; more usually they are on the next page or elsewhere and it becomes necessary for the user to refer from page to page, in order that he may comprehend the figures. This promptly results in fatigue of the eyes with consequent loss of time, confusion of the intellect and probable profanity.

In order to avoid these things the principal terms, etc., have been written directly upon the accompanying plates and it is believed that the arrangement will be found convenient and useful.

It will be seen by reference to the text, that the terms applied to each principal part of the anatomy, have been arranged in alphabetical order, beginning with those of the head, those of the thorax, abdomen, legs and wings following in the order named.

It seems deplorable that there should be in general use several names for any one part. It is difficult to find unoccupied corners enough in one's memory to accommodate the single terms, to say nothing of those regions having from 4 to 6 names.

For example, those parts known variously as the Calypters, Tegulae, Squamulae, Alulae, etc., *ad nauseum*, illustrate what is meant.

The chief end of a scientific nomenclature as the writer understands it, is to preserve us from this very confusion and multiplicity of terms; and if this end be not attained, then why not return to vulgarisms? We should then at least gain an inkling of what was meant.

In compiling this list of terms an effort has been made to include therein, not only the names of the bristles and bristle-bearing surfaces of the anatomy, but also those other terms, which are most often mentioned in descriptions of the various writers on Dipterology; hoping thereby to extend the scope of its utility.

It will also be seen that one, large species, of common occurrence and wide distribution, has been used wherever possible in the illustrations, for the purpose of allowing a comparison of the plates with the actual organism; which arrangement should prove of value.

Most grateful acknowledgment is herewith made of the help afforded in the preparation of this paper by Mr. C. H. T. Townsend in the revision of plates, additions and corrections.

Mr. C. W. Johnson and H. L. Viereck gave valuable assistance and advice. Prof. J. S. Hine and D. W. Coquillett also afforded valuable suggestions and last but not least Mr. Erich Daecke has shown the deepest interest in the work and was most generous in the matter, lending specimens, etc.

A short bibliography is herewith appended:

An Essay of Comparative Chaetotaxy, or the arrangement of the characteristic bristles in Diptera, C. R. Osten Sacken, Entomological Society of London, Nov. 5th, 1884.

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Explanation of Terms used in Entomology, Dr. Jno. B. Smith, Brooklyn Entomological Society, Brooklyn, N. Y. 1906.

The Taxonomy of the Muscoidean Flies, Including Descriptions of New Genera and Species, C. H. T. Townsend, B. Sc., Smithsonian Misc. Collections No. 1803, 1908.

#### BRISTLES AND REGIONS OF THE HEAD.

Antennae, a pair of jointed sensory organs, borne, one on each side of the head. Always 3-jointed in the Myodaria and bearing a dorsal arista, which may be plumose, pubescent or bare.

Antennal foveae, a pair of grooves in the middle of the face as though for the lodgment of the antennae; they may be separated by a carina or keel and are bounded on the sides by the facialia or vibrissal ridges.

Arista, a specialized bristle; borne on the upper or dorsal side of the third joint of the antenna in the Myodaria. Morpho-

logically speaking, it is the rudiment of the terminal antennal joints, to be found in the lower groups of Orthorrapha. Primarily functional as a tactile sensory organ.

Beard, pilosity arising and depending from the lower portion of the occiput.

Bucca, that part of the head and face below the transverse impression, under the eye, extending downward to the edge of the mouth opening upward along the outside of the facialia and continuing backward to the great foramen.

Cheeks, the space between the lower border of the eye and oral margin, merging into face at front and limited by the occipital margin behind. This term is not exactly synonymous with the Buccae of Hough, which see.

Clypeus, a part of the mouth structure, often visible below the margin of the mouth in front as a more or less visor-shaped piece.

Cruciate bristles, a pair in the middle of the lower part of the front, directed inwardly and forwardly; observed in some Calypterae and Acalypterae.

#### HEAD.

Epistoma, the oral margin and an indefinite space immediately contiguous thereto; not often now used.

Eyes (compound), placed on the sides of the head and composed of many simple eyes they may be bare (glabrous), or pubescent.

Eye, occipital margin of. That edge of the compound eye bordering upon the posterior orbit and occiput.

Face, that area of the head bounded by the base of the antennae, the oral margin, eyes and cheeks.

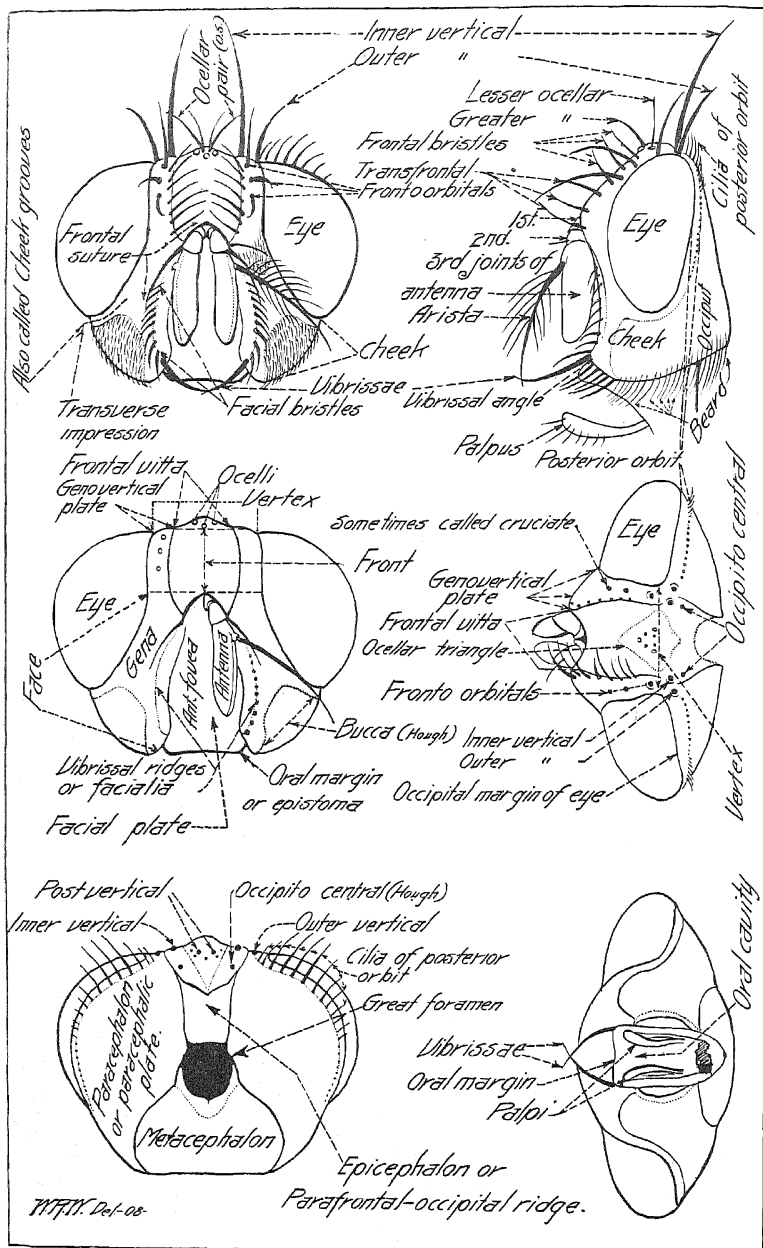
Facial depression, see Antennal foveae.

Face, transverse impression of. See transverse impression.

Facial bristles, inserted in a series on each side of the middle portion of the face, above the vibrissae along the facialia; especially conspicuous in Tachinidae.

Facialia, two distinct ridges inside the arms of the frontal suture, constituting the lateral boundaries of the facial depression.





Facial carina, a keel or projection lying between the antennae, on the median line of the face, present in some Calyptræ.

Facio-orbital bristles, borne on that portion of the face lying below the base of the antennae and limited below by the transverse impression.

Foramen, great or central. The opening in the center of the occiput at the back of the head; into which is inserted the neck.

Front, the space between the eyes in dichoptic flies; limited by the upper margin of the head and a line drawn through the root of the antennae.

Frontal bristles, ascending. The uppermost of the frontal bristles from 1 to 4 in number.

Frontalia or Frontal vitta, that portion of the front bounded by the ocelli, the root of the antennae and the genovertical plates or parafrontals.

Frontal bristles, a row on either side of the median vitta descending to or often below the root of the antennae, on the side of the face anteriorly; of much use in the classification of the Calyptræ.

Frontal lunule, an oval or crescentic space just above the root of the antennae in Cyclorrhaphous flies, bounded by the frontal suture.

Frontal suture, ptilinal suture or frontal fissure. A suture having the general shape of an inverted U, the arms of which make with each other more or less of an angle. It occupies the center of the muscoidean face and it is through this suture, just above the root of the antennae, that the ptilinum is thrust in forcing the cap from the pupa shell.

Frontal triangle, the triangle between the eyes and the root of the antennae, the apex of which is above. Sometimes the term is applied to a triangle indicated by color or depression in the dichoptic front.

Fronto-orbital bristles, a bristle or bristles on each side of the front near the orbit, immediately below the vertical bristles; there may be 1, 2 or none on each side.

Fronto-orbital bristles, lower. Situated on the lower part of

the front near the eyes and not quite in line with the fronto-orbitals. They are not of frequent occurrence.

Gena, or parafacial, that part of the side of the face which is above the transverse impression and bounded on the sides by the arm of the frontal suture and the anterior border of the eye respectively.

Genovertical plate, the continuation of the gena upward extending to the vertex.

Inner vertical bristles, the inner pair of 4 bristles inserted on the vertex more or less behind the upper and inner corner of the eye, erect or convergent; usually the larger of the 2 pairs.

Lateral facial bristles, one or 2 bristles sometimes present on the sides of the face below, toward the eye.

Lunula, see frontal lunule.

Mesofacial plate, that portion of the face enclosed by the frontal suture and the vibrissal ridges in which are found the antennal foveae.

Metacephalon, the segmented post oral portion of the head.

Occiput, that portion of the head in the rear of the cheeks and eyes, upon the lower part of which is borne the beard.

Occipito-central bristles, a pair of bristles on the upper part of the occiput, just below and almost in line with, the inner vertical pair.

Occipito-lateral bristles, a pair of bristles borne one on each side a little back of, below and toward the outside of the outer vertical bristles.

Ocellar bristles, lesser. From 3 to 12 pairs, usually inserted in two parallel lines, sometimes in 4, which begin very close to the insertion of the greater ocellar bristles and extend backward a variable distance.

Ocellar bristles, ocellar pair, greater ocellars, etc., on the ocellar triangle just back of the foremost ocellus; they are always diverging and pointing forward.

Ocellar plate, or ocellar triangle. A triangle, indicated by grooves or depressions, on which the ocelli are situated.

Ocelli, or simple eyes, on the upper part of the front in the middle, between or a little back of the compound eyes, usually 3 simple eye lenses, present in most diptera.

Orbits, the space immediately contiguous to the eyes, sometimes indicated by structural characters, at other times indefinite.

Oral margin, the anterior edge of the oral cavity, being the lower edge of the epistoma.

Oral cavity, the cavity directly below the edge of the epistoma, covered over in front with an oblique posteriorly extending skin or membrane.

Outer vertical bristles, the outer pair of 4 bristles, borne on the vertex and nearest to the inner and upper corner of the eyes; erect or diverging.

Palpi, the mouth feelers; in the Calypterae usually club shaped and attached to the proboscis near its base.

Paracephalon or paracephalic plates, the lateral segmented portions of the occiput, separated by the metacephalon and the epicephalon. Parafacials, see Gena.

Parafrontals, see genovertical plates.

Parafrontal—occipital ridge or Epicephalon, a ridge-like sclerite formed by what seems to be a continuation of parafrontals over vertex on occiput and which bifurcates above the great central foramen.

Peristoma, see epistoma.

Posterior orbit, that portion of the occiput bordering on the occipital margin of the eye; usually bare and bounded on the rear by a row of small bristles.

Posterior orbit, cillia of. A row of bristles along the rear border of the posterior orbit, in the Calypterae.

Postvertical bristles, the most rearward pair of lesser ocellar bristles, placed close together, one on each side of the median line of the occiput, below the inner verticals and above the occipitocentrals.

Preocellar bristles, a small pair of bristles sometimes found on the front below the anterior ocellus.

Proboscis, the extensile mouth, usually more or less folded up under the head when at rest.

Ptilinal suture, see frontal suture.

Transfrontals, a variable number of the frontal bristles which are directed across the frontal vitta.



Transverse impression of the face. Also called cheek groove (Townsend). A more or less distinct depression beginning at the ventral end of the arm of the frontal suture, running thence almost horizontally, becoming narrower as it proceeds, under the eye, to the occipital margin thereof.

Vertex, the top of the head bounded by the eyes, front and occiput.

Vertical triangle, the triangle on the upper part of the head between the eyes in holoptic flies, it bears the ocelli which may be situated on a triangle indicated by grooves or depressions or colorations, called the ocellar triangle.

Vibrissae, a pair of stout bristles on the lower end of the facialia, immediately above the peristomium and below the antennal foveae on each side, often accompanied by some smaller bristles.

Vibrissal angles, two prominences at the lower ends of the facial ridges upon which are borne the vibrissae.

Vibrissal papillae, projections sometimes present at the vibrissal angles.

Vibrissal ridges, see facialia.

#### BRISTLES AND REGIONS OF THE THORAX.

Acrosticals, posterior and anterior. A row of bristles next to the median line, on the dorsum between the 2 rows of dorso-centrals; those before the transverse suture are called anterior or preacrosticals: those behind it, posterior or postacrosticals.

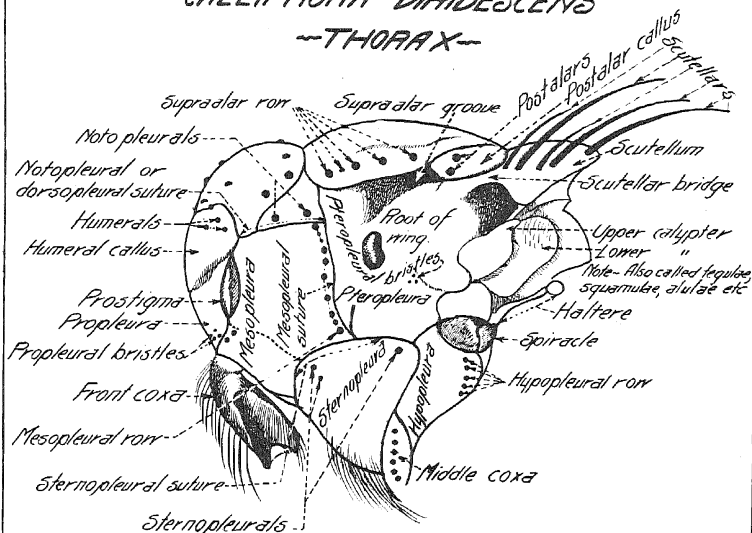
Calypters, a pair of membranous scales situated above the halteres and back of the root of the wing, one above the other. They have been called variously by different authors, tegulae, alulae, squamae or squamulae, calyptrae, etc. The terms alulae and tegulae are applied to entirely different parts by several writers and are the occasion of confusion in the matter.

Discal scutellars, see scutellars.

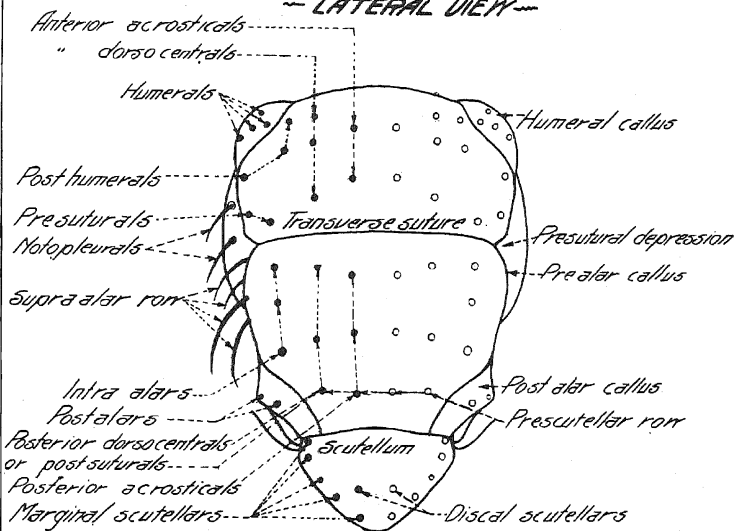
Dorso-central bristles, on each side, a row on the inner part of the dorsum at the outer side of the acrostical. Those before the transverse suture called anterior, those behind, posterior dorsocentral or postsutural.

# *CALLIPHORA VIRIDESCENS*

## --THORAX--



## -- LATERAL VIEW --



## -- DORSAL VIEW --

THPTX.-De 1-08-



Humeral bristles, one or more bristles inserted on the humeral callus.

Humeral callus or humerus, each of the anterior superior angles of the mesothorax, usually a more or less rounded callus.

Hypopleura, the space over the middle and hind coxae between the metapleura and pteropleura.

Hypopleural row, a row of bristles running in a more or less vertical direction on the hypopleura; usually directly over the hind coxae. They are sometimes grouped into a tuft and occur only in the Calypterae.

Intraalar, a row of 2 or 3 bristles between the supraalar group and the dorsocentral bristles.

Intra humerals, see post humerals.

Mesopleura, the space situated in front of the root of the wing, between the dorsopleural and sternopleural sutures.

Mesopleural row, bristles inserted on the mesopleura near the angle formed by the dorsopleural and mesopleural sutures.

Mesopleural suture, a suture running from the root of the wing downward and separating the mesopleura from the pteropleura.

Metapleura, the sides of the metanotum, a more or less swollen space at the outside of the metanotum and between it and the pteropleura and hypopleura. (More or less hidden by the calypters in the figure.)

Notopleural bristles, usually 2, inserted immediately above the dorsopleural suture, between the humeral callus and the root of the wing, on the bottom of the presutural depression.

Notopleural or dorsopleural suture, the suture running from the humerus to the root of the wing, separating the mesonotum from the pleura.

Post alar bristles, on the postalar callus back of the supraalar bristles.

Post alar callus, a more or less distinct rounded swelling, situated between the root of the wing and the scutellum.

Posthumeral or Intrahumeral bristles, one or more bristles situated on the inner margin of the humeral callosity.

Prealar callus, a not very prominent projection, situated before the root of the wing, on the side of the mesonotum, just back of the outer end of the transverse suture.

Prescutellar row, the hindmost bristles of the acrostical and dorsocentral rows, forming a transverse row in front of the scutellum.

Presutural bristles, one or more bristles, situated immediately in front of the transverse suture, above the presutural depression.

Presutural depression, usually triangular in shape, at the outer end of the transverse suture, near the notopleural suture.

Propleura, a space situated immediately in front of the anterior spiracle of the thorax and below the humeral callus.

Propleural bristles, one or more bristles inserted on the lower part of the propleura, immediately above the front coxa.

Proalar bristle, the Pro alarborste of Stein, in the Anthomyidae, a bristle on the back of the thorax which stands immediately before the largest and strongest supraalar bristle at the base of the wings.

Prostigma or anterior thoracic spiracle, placed between the propleura and the mesopleura, immediately below the humerus.

Pteropleura, situated below the root of the wing, back of the mesopleural suture.

Pteropleural bristles (rare), inserted on the pteropleura, hard to see; found in *Trypeta*.

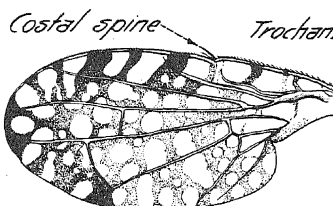
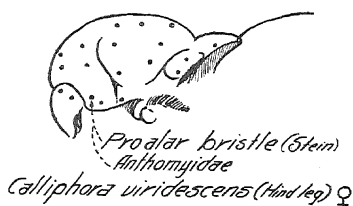
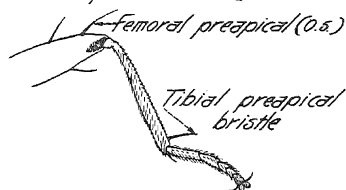
Scutellar bristles, discal. Usually a single pair of bristles borne on the dorsal portion of the scutellum, one on each side of the median line, slightly behind its middle.

Scutellar bristles, marginal. Usually a distinct row of large bristles, borne on the margin of the scutellum, which point upward and backward with a slight curve inward.

Scutellar bridge, a small ridge on either side of the scutellum, connecting it with the mesonotum.

Scutellum, a sub-hemispherical body posteriorly cut off by an impressed line from the dorsum of the mesothorax; it usu-

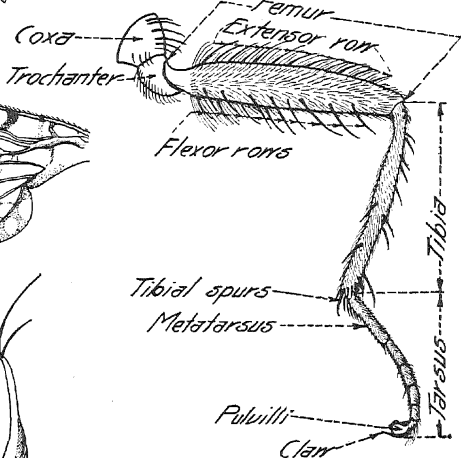
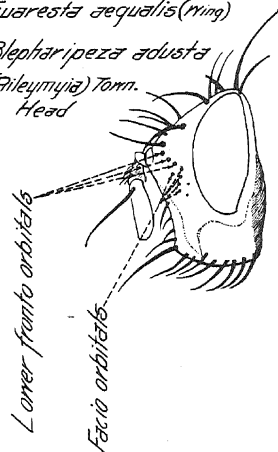
*Tetanocera plumosa* (Hind leg)



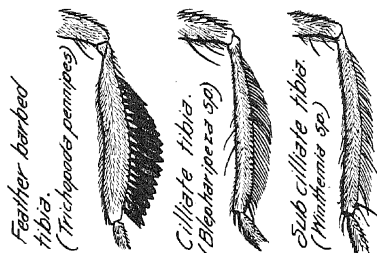
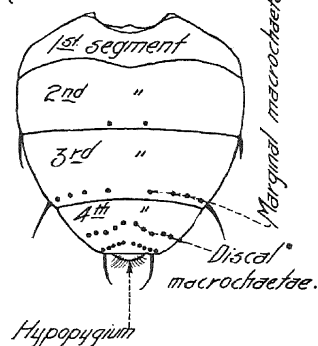
*Euaresta aequalis* (ring)

*Blepharipeza adusta*

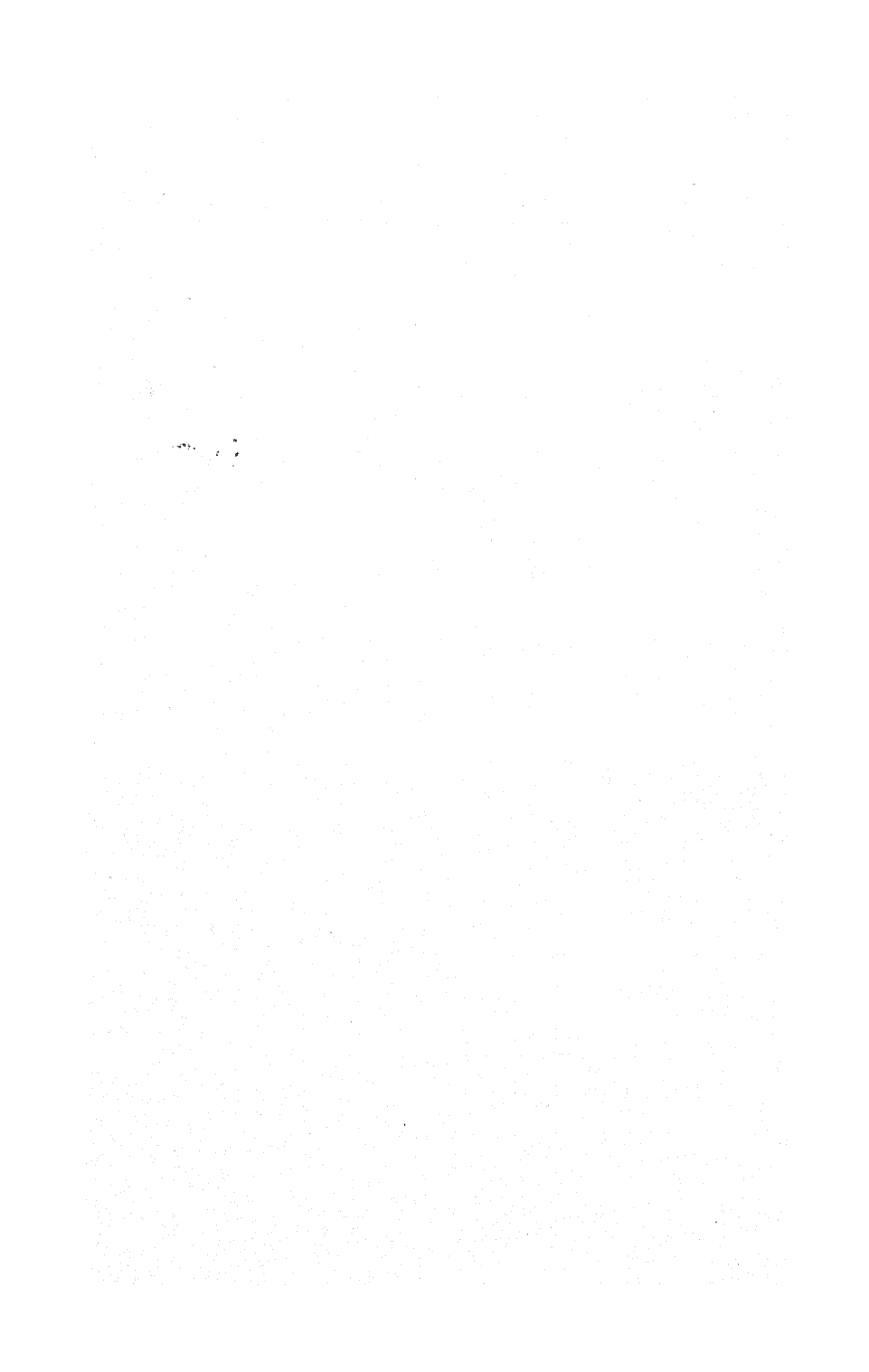
(*Pileomyia*) Town.  
Head



*Archytas hystrix*  
(Abdomen dorsal view)



WJW Del. 09-



ally presents a triangular or shield shaped surface upon its dorsal area in the Diptera.

Squamae, see calypters.

Sternopleura, the lower part of the pleura, below the sternopleural suture.

Sternopleural bristles, one or several bristles on the sternopleura below and near the sternopleural suture.

Supraalar bristles, usually one to 4 bristles above the root of the wing, between the notopleural and postalar bristles.

Supraalar groove or cavity, a groove on the mesothorax immediately above the root of the wing.

Sternopleural suture, the suture below the dorsopleural suture, nearly parallel with it and separating the mesopleura from the sternopleura.

Transverse suture, an impressed line running straight across the mesonotum and terminating a little in front of the root of the wing. It is more or less incomplete in the middle.

Trichostical bristles, a fan like row on the metapleura, not found in the calypterae.

#### LEGS.

Claws (ungues).

Two chitinous hooks placed at the end of the last tarsal joint on each leg.

Coxa, the joint of the leg, which connects that member to the body of the insect.

Empodium, a median appendage on the under side of the foot, between the claws, either in the form of a pad, or like a bristle or a spine.

Extensor row, a row of bristles on the upper surface of the femur.

Femur, almost invariably the longest and stoutest joint of the legs. It is the third joint counting from the body outwardly.

Flexor row, one or more rows of bristles placed along the lower surface of the femur.

Mesal surface of the leg. That surface of the front and hind legs which is naturally turned toward the body.



Metatarsus, that tarsal joint which is next to the tibia. Dr. Williston urges the abandonment of this term as etymologically incorrect.

Preapical bristle, a large bristle found on the outer third of the tibia in some families of Acalypterae, it is quite distinct from the tibial spurs and is placed on the outer surface of the tibia.

Pulvilli, two pad-like fleshy cushions, attached to the last joint of the tarsus below the claws.

Tarsus, the division of the leg beginning at the outer end of the tibia; usually composed of 5 joints in the Diptera.

Tibia, that division of the leg which is attached to the outer end of the femur; it may be likened to the shin of an animal.

Tibial spurs, one or more distinct bristly spines terminating the tibia.

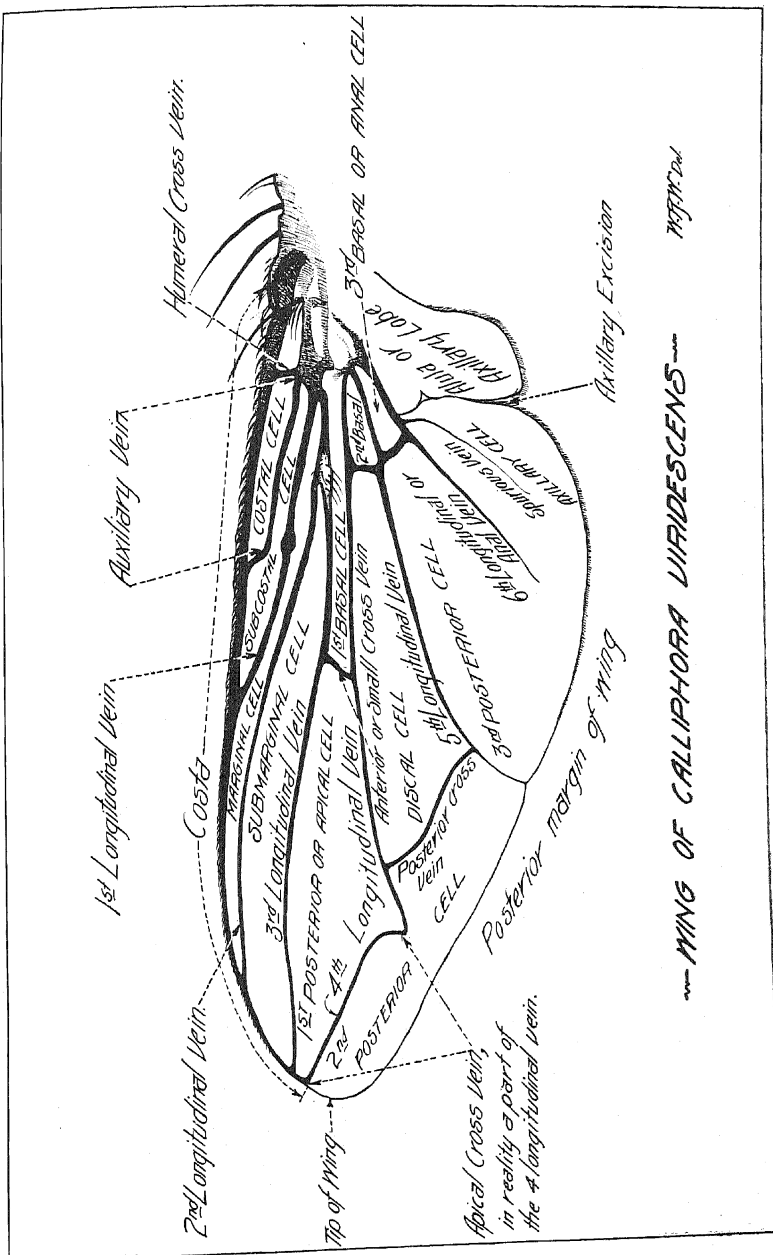
Trochanter, that joint of the leg which connects the coxa and femur.

#### WINGS.

It is deemed unnecessary to go very far in defining the veins and regions of the wing because of the fact that the plate published herewith shows more clearly than is possible to express in words, the relation of these parts, one to another. There are, however, a few terms which would be the better understood for a few words of explanation; these will be found below.

Axillary lobe, also called alula by some writers. That portion of the hind margin of the wing between the axillary excision and the base of the wing. The term alula used in this connection is more or less misleading as the same is used to denote the calypters or squamae.

Apical cross vein, that portion of the fourth vein lying between the bend and the margin of the wing in the muscoidean flies. This is of course not a cross vein at all, in the true sense of that term and Mr. C. H. T. Townsend very properly remarks, "This term should be employed only when the fourth vein is furcate, or shows indication of a previous furcation in





a stump, fold or wrinkle," it is, however, used quite generally by the older writers to indicate that portion of the fourth vein above mentioned.

Apical cell, the first posterior cell, i. e., that cell which is bounded by the third vein, the anterior cross vein, the fourth vein and the outer margin of the wing.

Costal spine, a stout bristle present in some families of flies, on the costa, near the end of the auxiliary vein.

Middle, anterior or small, cross vein; it should be remembered that this vein always connects the third and fourth longitudinal veins and bounds the inner end of the first posterior cell.

Spurious vein, a fold running from the base of the axillary excision toward the hind margin of the wing. There is in the Syrphidae also a spurious vein running from the base of the wing in a more or less longitudinal direction through the first basal and first posterior cells and lying across the anterior cross vein.

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### *Pemphigus venafuscus* n. sp.\*

BY EDITH M. PATCH.

(Plate XVII)

On October 1, 1909, large numbers of a dark winged flocculent *Pemphigus* were observed by the writer to be settling upon the trunks of lilac bushes (*Philadelphus syringa vulgaris*) about half a mile from the University of Maine Campus. They sought the rough places in the bark and deposited the minute sex forms characteristic of this genus. A *Syringa* aphid seemed so remarkable an occurrence that the lilacs on the campus were examined and were found to be similarly sought by the same unknown species. This shrub was not, to all appearances, a haphazard choice on the part of the aphid, for maples, oaks, and numerous other trees close at hand were avoided.

It was a good flying season for aphids and a careful watch

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\*Papers from the Maine Agricultural Experiment Station: Entomology, 34.

was kept for about fifteen days during which time this *Pemphigus* was particularly numerous upon the wing. It was found to be seeking the bark of elm (*Ulmus americana*) and red ash (*Fraxinus pennsylvanica* Marsh). On the red ash they were seeking also the ash clusters of a gall mite where they deposited the true sexes as they did in the rough bark. (*Eriophyes fraxiniphila*, Hodgkiss, Me. Agr. Exp. Sta., Bul. 162, p. 367).

In all these situations on the bark of lilac, elm, and ash, and in ash clusters, the minute apterous males and females molted, mated, and the winter eggs were subsequently laid.

On May 13, 1909, the newly hatched aphids were observed to be crawling up the trunks of the lilac, and by May 20 they were found to be numerous on both the lilacs and ash where they had settled in the angles of the twigs or about the swelling buds. They were feeding, growing and excreting honeydew normally on both these hosts. Fine long bluish-white flocculent strands are secreted from six rows of abdominal glands giving the aphids a very downy appearance.

This is the first time in my observations of *Pemphigus* when I have found the same species choosing widely different hosts for the same stage. Whether the stem mothers of *Pemphigus venafuscus* are also able to develop upon the elm it has not yet been possible to ascertain.

The fall migrants of 1908 were on the wing for more than a month but the host plant which they had left was not located.

Reference to my *Pemphigus* records and mounted slides of 1906, however, showed specimens and notes of apterous viviparous, winged viviparous, pupae, and young of the same species which were found upon the twigs of ash June 21-29, 1906, at Orono. They did not occur on the leaves.

By reference to the Maine Station collection and through the kindness of other collectors of this genus I was enabled to compare specimens of this new *Pemphigus* with authentic specimens of thirteen named species of *Pemphigus* as well as several undescribed species. This comparison emphasized the

fact that *venafuscus* is a very distinctive species. The wings alone would serve to characterize it. Their dark, smoky condition is similar to that commonly found in *Lachnus*, but unusual for *Pemphigus*, and the venation is heavier than any known *Pemphigus*.

***Pemphigus venafuscus* n. sp.**

*Apterous viviparous*.—Large dark brownish globular forms. Mottled in appearance due to six powdery discs on each abdominal segment, two nearly mid dorsal and a lateral line of two on each side. At time of collection these old forms were pulverulent rather than flocculent over the general body surface but they possessed a flocculent caudal tuft.

Length of antennae, 1.01mm. with segments as follows: I, .06 mm.; II, .15 mm.; III, .23 mm.; IV, .19 mm.; V, .18 mm.; VI, .2 mm. Total length of body exclusive of antennae, 3.5 mm.

Found in sticky, wooly colonies along twigs of ash chiefly on new growth but somewhat on old. Collected at Orono, June 21, 1906, together with minute progeny and pupae nearly ready for the last molt.

*Winged viviparous*. Pupae collected June 21 on ash twigs were saved in order to obtain the mature alate forms. The pupae were exceedingly flocculent over the whole surface of the abdomen. By June 29 they had molted and begun to produce.

Head, antennae, thorax and legs black. Abdomen greenish black and flocculent. Antennae and wings as in the fall migrants.

Body length, 3 mm. Beak extending over the first third of the abdomen.

*Fall migrants*. These winged *sexuparae* (form producing the true sexes) were taken on the wing and collected from the trunks of lilac, red ash and elm in October, 1908. At time of collection they resembled the other winged viviparous generation except that they were bluish black rather than greenish black and the abdomens of the migrant *sexuparae* are shrunk in appearance and not plump like the other viviparous forms.

Head, prothorax, and thorax and legs black, flocculent. Antennae black, 1.55 mm. in length with segments as follows: I, .1 mm.; II, .15 mm.; III, .55 mm.; IV, .25mm.; V, .275 mm.; VI, .225 mm. Straight transverse sensoria occur regularly spaced, varying slightly in number but averaging 19 on III, 10 on IV, 11 on V, 4 or 5 on VI., Asensorium, circular in shape, is distinct on distal 11. The usual terminal sensoria on V and VI. Near the base of III there is an irregular jut, the

rest of the segment is fairly even in outline. Wings smoky and dark with dark veins. Wing expanse 9 mm. Wings at rest usually deflexed but more often reposed than in most species.

In general, a blue-black species with blue-white flocculency. The wavy filaments are as long as the body and curl out from the side of the abdomen under the margin of the wings. The wax filaments are silky in appearance and are slightly fluted on some of the specimens. This condition of the filaments is true, of course, only for those individuals which have not become too much travel worn.

*Oviparous female.* An apterous non-rostrated form, yellow, with semi-transparent smoky white legs and antennae. Body length, 1.15 mm. Antenna, .28 mm. Five distinct segments. Terminal sensoria on IV and V. Eyes a group of 3 pigmented areas.

*Male.* Apterous and non-rostrated. Body greenish with semi-transparent smoky white legs and antennae. Body length, .75 mm. Antenna, 2.75 mm. Five distinct segments. Terminal sensoria on IV and V. Eyes a group of 3 pigmented areas.

Both the male and the female molt once before copulation. A single egg is deposited, yellow and glistening with a downy white secretion. The egg subsequently turns glistening black.

#### EXPLANATION OF PLATE XVII.

Fig. 1. Oviparous female. On lilac, October, 1908. Actual length of body 1.15 mm.

Fig. 2. Male. On lilac, October, 1908. Actual length of body .74 mm.

Fig. 3. Pupa. On ash, June, 1906. Actual length of body 2.66 mm.

Fig. 4. Stem mother. Very young nymph. Collected from lilac, May, 1909. Actual length of body, exclusive of beak, 1.1 mm.

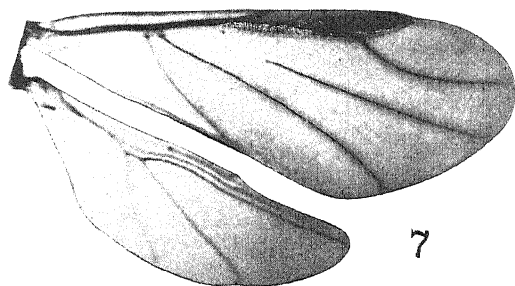
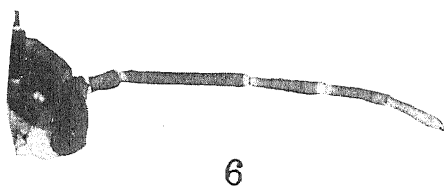
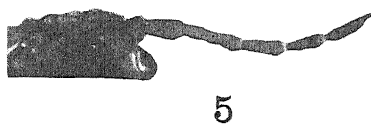
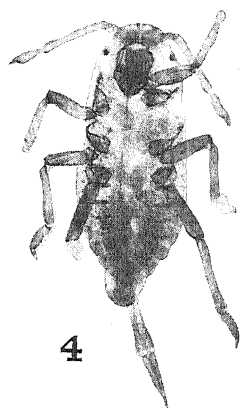
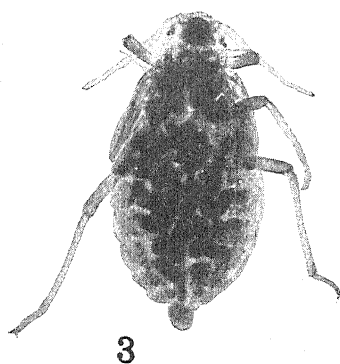
Fig. 5. Top of head and antenna of apterous viviparous form,—full grown stem mother. Actual length of antenna 1.01 mm.

Fig. 6. Top of head and antenna of alate viviparous form, fall migrant. Actual length of antenna 1.55 mm.

Fig. 7. Wings of fall migrant.

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*Thecla blenina* Hew. (*siva* Edw.).—This beautiful little species has been recorded from Colorado, on the authority of Bruce, but little seems to be known of its occurrence here. It is therefore worth while to report that Mr. Nash took it in Fueblo County many years ago; and I have before me a specimen caught by Mr. S. A. Rohwer at Rifle, July 3, 1908.—T. D. A. COCKERELL.



PEMPHIGUS VENAFUSCUS PATCH.





## Notes and Descriptions of Wasps.

By S. A. ROHWER, Boulder, Colo.

### **Crabro (Hoplocrabro) boulderensis** n. sp.

*Male*.—Length 7 mm.—The middle portion of the clypeus with three small obtuse teeth; outside of the produced portion is a distinct tooth; no middle carina on the clypeus; mandibles bidentate at the apex; front, cheeks, and vertex with distinct, rather small separate punctures; facial basin not bounded above by a distinct carina; a distinct furrow from the anterior ocellus; supraorbital fovea more or less distinct; ocelli in an equilateral triangle; the distance between the lateral ocelli less than the distance between a lateral ocellus and the nearest eye margin; antennæ slender, sparsely clothed with thin white pile; apical joint truncate, the third joint distinctly longer than the fourth. Pronotum subtriangular, each anterior angle raised into an obtuse, rounded, low tooth; the anterior face of the pronotum punctured; the dorsulum and scutellum shining, with some small scattered punctures, the scutellum rounded, slightly impressed. Mesopleuræ shining sparsely punctured; a strong carina from the tegulæ to the pectus, this carina is bent in the middle. Metathorax short, rounded, with a longitudinal carina and a few irregular striæ basely; metanotum and metapleuræ shining, with a few punctures; the posterior face margined below. Legs stout, normal; the posterior tibiæ with flattened spurs. The recurrent nervure received by the cubital cell as far from the apex as the length of the transverse cubitus. Abdomen longer than the head and thorax, finely punctured, the apical segment a little more coarsely so than the preceding. Black, clypeus, a line on the scape in front, two spots on the pronotum, tubercles, postscutellum, a line on the four anterior tibiæ and tarsi exteriorly, and the base of the posterior tibiæ *ivory-white*; tegulæ brownish. Head and thorax clothed with white pile, denser on the pleuræ and the clypeus. Wings dusky, venation black.

*Type locality*.—Boulder, Colorado. One male found dead on a window sill, March 6, 1909, by S. A. Rohwer.

Very distinct from all other described species.

### **Rhopalum (Moniaecera) Ashm.) abdominalis** (Fox).

The male of this species is very much like the female. The abdomen is entirely black and, more slender than in the female; length 4 mm. The male may be separated from *asperatus*

(Fox) the only other species of the group *Moniaecera* by the normal apical joint of the antennæ. The male here mentioned was collected in Lee County, Texas, by G. Birkmann. Mr. Birkmann also took two females in Lee County.

***Rhopalum lucidum* n. sp.**

*Female*.—Length 4.75 mm.—In general much like *R. modestum* and *pedicellatum*. Anterior margin of the clypeus rounded, with a small quadrate tooth in the middle; second antennal joint longer than the third, the fourth longer than the second, the apical longer than the preceding. The head and dorsulum shining, with small scattered punctures; an impressed line from the anterior ocellus; the suture between the dorsulum and the scutellum deep, not foveolated. The metathorax rounded, without an enclosure, a faint line-like furrow in the middle. The first segment of the abdomen longer than the second and the second longer than the third; the pygidium strongly margined, narrower apically. Shining black; scape, mandibles, part of the tubercles and tegulæ yellow; base of the second dorsal segment, the venter more or less, and the pygidium testaceous. Legs: four anterior legs except the base of the coxæ, and a spot on the intermediate femora yellow; part of the posterior coxæ and the base of the posterior tibiæ yellow; the rest of the legs black. Wings hyaline iridescent; the venation brown.

*Type locality*.—Harrisburg, Pa. One female collected by P. R. Myers, July 25, 1908.

The following table will separate the females of the group *Rhopalum* in the restricted sense (=group *pedicellatus* of Fox):

Clypeus with a small rounded tooth in the middle, no tooth at the side;  
the base of the second abdominal segment testaceous.

***lucidum* Roh.**

Clypeus acutely produced and with a small lateral tooth . . . . . I.

i. Coxæ pale; middle segment with an enclosure . . ***pedicellatum* Pack.**

Coxæ black; middle segment without an enclosure . . ***modestum* Roh.**

***Mimesa myersiana* n. sp.**

*Female*.—Length 7.9 mm.—Anterior margin of the clypeus produced in the middle into a bidentate tooth. The front with rather close medium size punctures; head behind the ocelli and the cheeks shining, polished, almost impunctate; two crescent-shaped furrows connecting the two lateral ocelli; sometimes there is a short furrow from each lat-

eral ocellus; there is usually an impressed line from the anterior ocellus backward to the crescent-shaped line; from the anterior ocellus to between the bases of the antennæ is a line like carina, which is more distinct between the antennæ. The antennæ thicken toward the apex; the third joint is longer than the fourth, but is not as long as the fourth and fifth combined. Dorsulum punctured, in some places the punctures are confluent giving it a striated appearance; the central portion of the scutellum shining, polished, with a few scattered punctures; the sutures bounding the scutellum are deep, the one between the dorsulum and the scutellum foveolate; mesopleuræ shining with some scattered punctures; the enclosure of the metathorax clearly defined, longitudinally striate, the diamond-shaped fovea with some rugæ, posterior face punctured; metapleuræ shining. The second cubital cell slightly narrowed above; the second recurrent nervure interstitial or nearly so with the second transverse cubitus. The petiole of the abdomen about the same length as the hind trochanters and femora, slightly thickened toward the apex, sub-convex above with two more or less distinct longitudinal sulci. Pygidium long shining, with a few large punctures, surrounded by a strong carina. Color black; the apical joints of the palpi and the tarsi testaceous (in some specimens brownish); the face below the antennæ with dense silvery pubescence; thorax with a few scattered hairs; the base of the hind tibiæ with a bunch of silvery hairs. Wings clear, glassy, hyaline, iridescent; venation pale brown, stigma dark or pale brown.

*Male*.—Length 7 to 7.5 mm.—Anterior margin of the clypeus gently rounded, not emarginate. Antennæ somewhat moniliform, but not strongly so. Petiole rather longer than in the female. The apex of the abdomen has a curved spine. In general the male is like the female but the sculpture is somewhat coarser.

*Type locality*.—Wetzel's Swamp, near Harrisburg, Pa. Many cocoons collected by P. R. Myers, September 28, 1908; the adults hatching in January and February, 1909.

In the bidentate clypeus of the female this species is related to *barthi* Vier.; but the wings are clear hyaline, the scutellum is only sparsely punctured, and there are no steel-blue reflections from the thorax. It is also related to *simplicicornis* Fox, but the female has the clypeus different, and the pygidium surrounded by a strong carina. The male has the front more finely punctured than the male of *simplicicornis*, which is very closely allied, and the antennæ are somewhat moniliform.

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., JULY, 1909.

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This journal has reached its limit of pages and illustrations at the present subscription price. In 1890 we published one hundred and sixty-eight pages and a few text cuts. During 1908 we published five hundred pages, twenty-five full plates and thirty-six text figures. There has been no change in the price of the NEWS during the period mentioned, but if we conclude to increase the number of pages and illustrations, an increase in the subscription price is imperative. Owing to our knowledge of the difficulty of collecting one dollar for the NEWS we are loath to increase the price. It is astonishing to see how many persons are willing to have it for nothing, and even refuse to return the copies for which they have not paid. We judge from this that it must be some good. It is the appreciation of the few that encourages us to continue what has been a labor of love for the last twenty years.

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MR. C. GORDON HEWIT, of Manchester, England, has been appointed Entomologist to the Dominion Experimental Farms at Ottawa. He succeeds the late Dr. James Fletcher.

C. F. ADAMS has been promoted to the Dean and Directorship of the College of Agriculture and the Agricultural Experiment Station in the University of Arkansas. He has been Acting Director of the Experiment Station since the fifth of last November. He will continue in the Chair of Entomology, with the assistance of Mr. Paul Hayhurst of Harvard.

OUR INSECT FRIENDS AND ENEMIES, THE RELATION OF INSECTS TO MAN, TO OTHER ANIMALS, TO ONE ANOTHER, AND TO PLANTS, WITH A CHAPTER ON THE WAR AGAINST INSECTS. By John B. Smith, Sc. D. J. B. Lippincott Company, Philadelphia and London.—This is an excellent work by a well known authority and will be of great value to those persons who wish to have a guide to all the varied interests attached to insect life. A good idea of the scope of the work may be obtained from the contents as follows:—

Insects in their relation to the animal kingdom; Insects in their relation to plants as benefactors; In their relation to each other; In their relation to the animals that feed on them; In their relation to weather and diseases that affect them; In their relation to other animals; In their relation to man as benefactors; In their relation to man as carriers of disease; Insects in their relation to the household; In their relation to the farmer and fruit-grower; The war on insects.

There is one plate in color and 121 text figures. We heartily recommend this book as one that will surely create an interest in those who read it, for this fascinating study.

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## Doings of Societies.

The Entomological Society of Western Pennsylvania held its regular monthly meeting in Carnegie Museum, Pittsburg, Pa., Monday evening, May 3, 1909, President W. J. Holland presiding. Eleven members present. Director Holland exhibited a collection of Cossidae and Hepialidae from Australia, most all very rare species, some of which have just recently been described.

Mr. Robert Dickson exhibited a very interesting collection of blown larvae of the wood-boring moths, all mounted in their natural food burrows. Among these were *Prionoxystus robiniae*, in locust, *Sanninoidea exitiosa*, in peach, *Sesia acerni* in swamp maple, *Sesia pyri*, in apple, and *Sesia pictipes*, in wild cherry, also larvae of the clothes moth *Tineola bisselliella* mounted in a piece of cloth.

Mr. Henry Engel exhibited a lot of *Arctia virgo* larvae, which he has been feeding on lettuce on and off since last August. Mr. Engel also stated that he had observed a larvae similar to *Gortyna* feeding in *Rumex obtusifolius*. No one present knew what it was.

F. W. FRIDAY, *Secretary*.

The Entomological Society, of Western Pennsylvania, held its regular monthly meeting in Carnegie Museum, Pittsburg, Pa., Monday evening, June 7, 1909, President W. J. Holland presiding. Ten members present. A motion was passed to accept the membership as a whole of the Allegheny Naturalist Club. A committee, consisting of Messrs. Engel, Friday and Overbeck, were appointed to select a desirable locality for the Society to hold its annual field day.

Mr. Engel stated that the larvae feeding in *Rumex obtusifolius* turned out to be *Hadena passer*. The first moth emerging June 1st.

Mr. Robert Dickson exhibited some of his fine work in blown larvae and perfect imago of *Exartoma ferriferanum* Walk., bred in stems of *Hydrangae americana*, *Olethreutes albiciliana* Fernald., bred in stems of water weed (*Impassians bicolora*), also larvae and cocoon of *Melittia macmurtrei* Guer. bred in oak. The members then adjourned to Hotel Schenly, under escort of Director W. J. Holland, where the sociability of the Society was further continued.

F. W. FRIDAY, *Secretary*.

At a regular meeting of the Feldman Collecting Social, held April 21st, 1909, at 1523 S. 13th Street, Philadelphia, fifteen members were present. President Harbeck in the chair.

Mr. Daecke said collecting is very good so far in the vicinity of Harrisburg. *Cychnus viduus* Dej. and *stenostomus* Web. have been taken and the spring form of *Papilio ajax* Linn. was common April 18th and was also taken on the 11th. Another species seen was *Anthocharis genutia* Fabr. He also spoke on collecting of Coleoptera by Mr. Champlain at night with lantern which led to discussion on merits of certain lamps. Upon Mr. Daecke mentioning the rare *Clerus* caught in this manner Mr. Wenzel said they were undoubtedly on the trees after species of Scolytidae and if the trees were not infested with this group this year the *Clerus* will most likely have disappeared.

Mr. Viereck said he could corroborate Mr. Daecke's statement on this interesting locality and reported the capture of a bee there, *Bombus ternarius* Say, which record was the southern limit of this species and of a wasp, *Pepsis elegans* St. Farg., which was the farthest north this species has been found. He said Harrisburg seems to be a conjunction of the Alleghenian and Carolinian zones and has evidences of the overlapping of the Canadian and the Austroriparian with the former two.

Mr. Wenzel commented on Fall's recent paper on American *Diptotaxis* which includes 95 species of which 50 occur in New Mexico and Arizona, only 3 in Ontario, 5 in all the New England States and 9 from Pennsylvania and New Jersey. Upon inquiry as to whether this group was determined in the same manner as the *Lachnosterna* Mr. Wenzel read from the paper, "The male genitalia are quite simple so far as examined while in the female they are entirely membranous and therefore useless for comparison."

Mr. C. T. Greene exhibited two flies one of which, *Phornia regina* Meigen, had been attacked by a fungus which made a complete line around the abdomen at the joints of the segments giving this blue fly the appearance of having yellow bands or stripes and the other, *Pollemia rudis* Fab., a freak in which the second abdominal segment does not extend the full width.

Mr. Harbeck said he had taken about 140 specimens of *Andrena*, about 6 species, on willow blossoms in a short time at Glenside, April 17th and could have taken a thousand if he had so desired. Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

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At a regular meeting of the Feldman Collecting Social, held May 19th, 1909, at 1523 S. 13th Street, Philadelphia, twelve members were present. President Harbeck in the chair.

Mr. C. T. Greene exhibited the following Diptera: *Aeshna-soma rivertonensis* Johnson, ♂ and ♀, collected at Riverton



July 12, 1908, a species described from the ♂ only; *Baccha cognata* Loew, Roxborough, May 8, 1909, and *Brachyopa vacua* O. S. Roxborough, May 8, 1909, the second Pennsylvania record, the first being Collingdale, May 7, 1897.

Mr. Daecke reported that Mr. Champlain and himself had bred from a dead hickory limb, from Lemoyne, Pa. (opposite Harrisburg), a species of Dipterous parasite and the following Coleoptera: *Neoclytus erythrocephalus* Fabr., *Scolytus muticus* Say, *Liopus variegatus* Hald., *Phyllobaenus dislocatus* Say, and *Agrius egenus* Gory.

Mr. Harbeck recorded *Brachypalpus rileyi* Will. at Clementon, N. J., May 2, 1909.

Mr. Geo. M. Greene recorded a species of Diptera, *Tachydromia fenestrata* Say and a beetle, *Melasis pectinicornis* Welsh, collected on a dead tree at Clementon, N. J., May 2, 1909, and a specimen of *Stenosphenus notatus* Oliv., collected at Castle Rock, Pa., May 9, 1909, by C. W. Fenninger.

Mr. Wenzel exhibited a lamp with various improvements for collecting Coleoptera at night.

GEO. M. GREENE, *Secretary*.

The 29th regular quarterly meeting of the Pacific Coast Entomological Society was held on the evening of August 22nd, 1908, at the Café Bismarck, President Van Dyke in the chair. Twelve members and six guests were present. Mr. Walter Topp and W. H. Lange were elected to membership. The annual election of officers resulted in the same officers being re-elected.

Mr. Chas. Fuchs reported his trip east and made remarks upon *Thelydrias contractus* Motsch. (*Ignotus aenigmaticus*), with exhibition of specimens in the three stages of development.

Mr. J. C. Huguenin reported his summer's outing, and exhibited a box of Lepidoptera and one of Coleoptera; among the latter were a pair of *Purpuricenens dimidiatus* Lec., with red elytra, the tips of which were black, they were beaten from *Eriodyction glutinosum*.

Mr. Edw. Ehrhorn reported the results of a collecting trip to the Yosemite Valley, and exhibited a specimen of *Carabus vietinghovii*, taken in June at Rampart, Alaska.

J. C. Bradley entertained the members with an interesting account of his summer's work.

G. R. Pilate made remarks on collecting in the hills about Mills Seminary, Alameda Co., Calif., and exhibited several boxes of Lepidoptera.

F. X. Williams reported a trip to Carmel, Monterey Co., Calif. He exhibited specimens of *Sesia polygoni* that were raised from the stems of *Polygonum paronycha*; *Cydia cupressana*, very injurious to young cypress; *Euchactias oregonensis* from Shasta Co., Calif., and a species of *Merolonche*.

Mr. Ehrhorn urged the members of the Society to assist in adopting uniform names for insects and that a committee of five be appointed to take up the work, that the President be one of the committee. It was made a motion and carried.

President Van Dyke then appointed the following four members: Prof. Vernon Kellogg, Prof. C. W. Woodworth, Edw. Ehrhorn and J. E. Cottle.

Mr. Ehrhorn drew attention to the Argentine ant, stating that it had been found in Oakland and San Francisco and were very destructive. The species was determined by Pergande. Percy Baumberger exhibited specimens.

A communication from L. E. Ricksecker was read, in which was given a list of the Lepidoptera taken about San Diego.

Miss Julia Wright exhibited a box of Lepidoptera from Ceylon. Adjournment.

F. E. BLAISDELL, SR., *Secretary*.

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The 30th regular meeting of the Pacific Coast Ent. Society was held on the evening of November 21st, 1908, at the Hotel Manx.

President Van Dyke in the chair. Thirteen members were present and three guests.

Mr. J. E. Cottle reported his collecting trip to San Diego and exhibited a large series of *Hemileuca electra* taken at that place. He observed that the males fly early and the females about 2 o'clock, to deposit their eggs upon the wild buckwheat (*Eriogonum*).

Edw. Ehrhorn gave a talk on Horticultural Quarantine against insect pests. He mentioned that the live oak pest, *Phryganidia californica*, was extending its ravages to the Acacia trees, and it was constantly spreading. Some consider it introduced, others consider it native.

Dr. Van Dyke stated that the spread is probably due to the small birds being killed or driven off by boys. In the Golden Gate Park the birds are protected and the parasites few; just beyond the park limits the trees are denuded.

Dr. Blaisdell stated that he had taken the pest 30 years ago at Poway, San Diego Co., Calif. It was not common on the live oak.

Dr. Carroll Fox gave a very instructive talk on the campaign against fleas in San Francisco. He advised members when collecting to keep the specimens from the different animals separate and with the proper data, and to preserve them in 70 per cent. alcohol. Dr. Fox is depositing a series of named specimens in the California Academy of Sciences.

Other members made exhibits. Adjournment.

F. E. BLAISDELL, SR., *Secretary*.

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The 31st regular quarterly meeting of the Pacific Coast Ent. Society was held on the evening of February 27th, 1909, at Thompson's Café, San Francisco.

Dr. Van Dyke in the chair. Fourteen members and six guests were present.

Dr. Carroll Fox, L. R. Reynolds and Maurice B. Mitzmain were elected to membership.

Mr. F. W. Nunenmacher read an epitome of the progress of the study of the Coccinelidae. Stating as a grand total that 2,028 species, 192 genera and 85 varieties were known, and

that it took a hundred and twenty-nine authors to describe them.

Mr. J. G. Grundel repored a recent trip to the Tahiti Islands. He took a few Coleoptera and Lepidoptera. Among the Coccinelidae brought back were a number of specimens of *Coccinella abdominalis*. He reported a small ant as very destructive to other insects; while 550 species of native plants constituted the native flora, there are now over 2,000 species; the cocoanut weevil is very injurious there, scales (*Coccidae*) very abundant on plants around the settlements, especially on the imported plants. In the dense forests very little was found, an occasional moth or *Satyrus*?

Mr. L. R. Reynolds stated that exhaustive collecting was a good idea as the native fauna of most islands was rapidly being destroyed or obscured by the introduction of other species.

Dr. Carroll Fox stated that species of Sarcopsyllidae were parasitic on the fleas. That he found six of these mite-like organisms upon one flea; they are so microscopic that 20 or 30 could easily get on a single individual.

Dr. Van Dyke stated that the early stages were found in rats' nests, that they run over the ground in the larva stage and finally get on their hosts.

Dr. F. E. Blaisdell reported that his monograph on the Eleodiini of the United States would soon be issued as Bulletin No. 63 of the U. S. National Museum. It is a work of 519 pages, 13 plates and 8 text figures, and had been eight years in preparation. Many exhibits were examined and discussed.

F. E. BLAISDELL, SR., *Secretary*.

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A meeting of the Rhode Island Entomological Society was held in the offices of the Providence Forestry Company Monday, February 22nd, at 8 o'clock, nine members being present. After the minutes had been read and approved, a check-list of the Lepidoptera of Rhode Island was started and earliest and latest data taken. It was voted that the list be kept in card catalogue form and a catalogue cabinet was ordered.

Mr. Eddy exhibited some Coleoptera.

Mr. Pears a ♀ *Junonia coenia* taken at Riverside, R. I., and Mr. Place some specimens of *Psycomorpha epimenis* which he had just bred, the moths coming out in February.

After a general discussion the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

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A meeting of the R. I. Entomological Society was held in the office of the Providence Forestry Company on Monday, March 8th, at 8 P. M., 11 members and one visitors being present.

After the minutes had been read and approved two new members were admitted to the society; Mr. Joseph Bridgham and Mr. H. A. Cash.

Mr. Reynolds then exhibited the nest of a trap door spider and Mr. Kingsford exhibited a petrified snail.

After a slight review of the card catalogue and a social talk, the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

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A meeting of the R. I. Entomological Society was held in the offices of the Providence Forestry Co., March 22, at 8 P. M., ten members being present. After the minutes had been read and approved Mr. Bridgham exhibited some rare lepidoptera including *Palilio homerus*. Particular mention might be made of the *promethia* which he exhibited. Three of the wings although streaked and mottled in an unusual manner, were distinctly ♀ while the fourth was distinctly ♂.

Mr. Billson then exhibited some native Lepidoptera, which were viewed with much interest.

Mr. H. Anderson was then admitted to membership.

It was requested that all members bring a list of Spilingidae and Bombycidae for the card catalogue at the next meeting.

After a brief talk the meeting adjourned.

WILLIAM PLACE, JR., *Secretary*.

A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held March 18th at the John Crerar Library. Eight members present. Messrs. Neubarth, Beer, Liljeblad and Kwiat exhibited their collections of *Plusia* and allied genera and compared notes. Local captures were reported as follows:

<i>Xanthopastis timais</i> (Kwiat, 1)	<i>Autographa verruca</i>
<i>Euthisanotia unio</i>	" <i>precationis</i>
" <i>grata</i>	" <i>brassicae</i>
<i>Plagiomimicus pitychromus</i>	" <i>oxygramma</i>
<i>Stibadium spumosum</i> (Healy. 1)	" <i>rectangula</i>
<i>Cirrhophanus triangulifer</i>	" <i>alias</i>
<i>Basilodes pepita</i> (Healy, 1)	" <i>octoscripta</i>
<i>Plusiodonta compressipalpis</i>	" <i>selecta</i> (Liljeblad, 1)
<i>Calpe canadensis</i>	(Healy, 1)
<i>Panchrysia purpurigera</i>	" <i>ampla</i> (Neubarth, 1)
<i>Plusia aerea</i>	" <i>falcifera</i>
<i>Plusia balluca</i>	" <i>basigera</i> (Kwiat, 1)
<i>Euchalcia venusta</i> (Neubarth, 1; Beer, 1)	<i>Abrostola ovolis</i> (Liljeblad, 1)
" <i>contexta</i>	<i>Ogdoconta cinerola</i>
" <i>putnami</i>	<i>Marasmalus inficita</i>
<i>Autographa biloba</i>	<i>Amyna orbica</i>
" <i>pseudogamma</i>	<i>Aletia argillacea</i>
	<i>Anomis erosa</i>

Among the Coleopterists, Mr. Wolcott exhibited specimens of *Phytonomus castor*, Lec. and the curious transparent web-like cases formed by the larvae in which the transformation to adult takes place. He called attention to the recently published paper on the distribution of the North American species of his genus by R. L. Webster (ENT. NEWS, February, 1909), in which it is stated that "with Leconte's original description of *Phytonomus castor*, Canada is given as a locality for its occurrence. No other records of the species were found." The specimens exhibited were taken by Mr. Kwiat as larvae on a species of ground pea at Palos Park, Ill., May 30, 1907, and transformed to adult June 28, 1907. The species was determined by Dr. H. C. Fall.

Mr. Wolcott further stated that the *Haliphus nitens* shown

at the January meeting of the Section and recorded in the March number of ENT. NEWS was erroneously determined and proved to be *Haliphus subguttatus*, Lec. MS.

ALEX KWIAT, *Recorder*.

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The Brooklyn Entomological Society met at 55 Stuyvesant Avenue, April 1st, nineteen members and three visitors present. Dr. F. E. Lutz, of the American Museum of Natural History, was elected an active member.

John A. Grossbeck gave an illustrated talk on the Classification of the Lepidoptera as based on the Wing Venation. He used and advocated the Comstock-Needham system of nomenclature. The policy of the Society in devoting considerable time to illustrated lectures on fundamental principles, adopted this year, has already been proven a decided success. The average attendance is larger by over a third and scientific discussion more prolonged. It is a remarkable and unexpected fact that the increased attendance for the sake of the instructive lecture comes mainly from veterans who already possess doctors' or masters' degrees. Accessions from the ranks of beginners are mainly for the sake of the weekly field trips.

Dr. Lutz exhibited drawings of the wings of a common fruit fly which he has bred for ten generations. In the wild state the wing shows a considerable tendency to aberration in venation. This has been vastly multiplied by artificial selection. The later generations show striking examples of lack of bilateral symmetry in variation.

Mr. Engelhardt exhibited a large series of *Utetheisa*, collected from Canada and Guatemala, including the West Indies. The series radiated from a form of *bella* intergrading in one line to the typical *ornatrix*, and in another to the typical *pulchella* of Europe. *Bella* is very common in Porto Rico and Jamaica. The typical *ornatrix* were mostly from Texas. Apparently the evolution into distinct species is comparatively very recent.

R. P. Dow, *Recording Secretary*.







WORK OF MICROPARSUS VARIABILIS PATCH, ON DESMODIUM CANADENSE.—FIGURE OF MALE.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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## The *Desmodium* Aphid, *Microparsus variabilis* n. sp.\*

EDITH M. PATCH.

(Plates XVIII and XIX)

For the past few years a very distinctive aphid has been present in enormous numbers upon the Canadian tick-trefoil in the vicinity of Orono. On account of the size of the wing tracheæ and the abundance of material this was one of the species which the writer used in the study of wing venation and it was figured and named in that connection before the description of the species was put into shape. Although not as detailed as is desirable it is hoped that the description given here will serve to place this characteristic species.

### MICROPARSUS n. gen.

The ensiform cauda, the hemispherical anal plate, the cylindrical cornicles, the moderate hairs with spatulate tips, and the

\*Papers from the Maine Agricultural Experiment Station: Entomology 35.

form of the antennae all indicate a close relationship of this genus with *Macrosiphum*. It is clearly differentiated from *Macrosiphum* and any other named genus by the wing characters. The radial sector\* is short and strongly curved. The media is typically two branched. The cubitus and first anal are heavily shadowed. The hind wing is minute, the tip extending only to about the first anal of the fore wing, and is correspondingly narrow. The costal hooks of the hind wing are very near the tip of the wing. Typically the hind wing has only the radius. The shape and relative size of these wings are better indicated by the accompanying figures than by a detailed description.

***Microparsus variabilis* n. sp.**

The species under consideration is one of the most peculiar yet found in the family. I listed it first as *Macrosiphum* n. sp. as the cauda and cornicles would indicate. The head and antennae show *Myzus* tendencies, but the wings throw it out of any present genus. The heavy shadowing of the first anal and cubitus suggest the shadowed veins common in *Callipterus*. The two-branched media together with the frequent occurrence of a reversion of the three-branched condition presents a case similar to that of *Toxoptera*. The exceedingly small hind wing, however, and the very peculiar shape of the fore wing correlated with this are inconsistent with the characters of any named genus.

Mr. Sanborn in "Kansas Aphididae" describes and figures the winged viviparous form of this or a closely allied species as *Macrosiphum* n. sp. and corrects this to *new genus, new species* in "Errata to Part I," but suggests no name in either instance.

This species may be *Macrosiphum desmodi* Williams which he lists on *Desmodium canadense* but as that species is *nomen nudum* there is no means of ascertaining.

Mr. J. T. Monell collected the same species thirteen years

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\*For the wing vein nomenclature, the reader is referred to "Homologies of the wing veins of Aphididae, Psyllidae, Aleurodidae and Coccidae." *Annals of the Entomological Society of America*. June, 1909.

ago and has graciously given me permission to use the notes with which he records his collection, as follows:

"On *Desmodium marilandicum*, St. Louis, Mo., August 12, '86. Covering leaves and stem in immense quantity. Colors alive under one-half inch pocket lens. *Apterous*. Head generally reddish yellow. Neck black. Tail yellowish to yellowish green. Dorsum yellow to yellowish green with few delicate irregular pale green markings. Apex of femora black. *Winged* the same. In the adult apterous is small dusky ring on abdomen enclosing nectary.

"33 wings had monofurcate 3d discoidal.

"14 wings had bifurcate 3d discoidal.

"24 wings had no discoidals.

"5 hind wings had trace of base of 2d discoidal."

*Winged viviparous form*.—Head light greenish brown. Hairs with spatulate tips present on head and antennae. Antennae black except basal III. Antennae much longer than body; 2.83 mm. with segments measuring I, 0.12 mm.; II, 0.08 mm.; III, 0.61 mm.; IV, 0.57 mm.; V, 0.49 mm.; VI (base), 0.12 mm.; spur 0.84 mm. Sensoria: A few (usually 5) circular sensoria in a more or less regular row on III; on V the customary terminal sensorium; and on VI the terminal with crowded group of 6 marginal sensoria. Eyes dark red. Ocular tubercles prominent. Beak 0.44 mm. long extending just caudad 3rd coxa. Thorax light brownish green, lobes glistening; prothorax with a dark longitudinal median line. Wings with veins dark brown. First anal and cubitus heavily shadowed, others unshadowed but heavy. Total expansion 5.4 mm. Hind wing extending only to the 1st anal of fore wing. Radius present and often the tip of media. Legs with the proximal two-thirds of femora very pale, distal one-third glistening dark brown, tibiae dark at proximal half and distal tip, with space between pale. Tarsi dark. Abdomen light green with dark patch at base of each cornicle. Cornicle dark brown, cylindrical, strongly and about uniformly imbricated throughout its length. Imbrications nowhere forming polygonal reticulations. A little larger at base than at the middle and slightly flared at tip. Cornicles 0.3 mm. long. Cauda light yellowish green, ensiform, upcurved, 0.24 mm. long. Anal plate hemispherical when seen from dorsal aspect. Total length of body, exclusive of antennae, 1.6 mm. Width 0.7 mm.

*Apterous Viviparous Form*.—Head light brown. Antennae with I, II, and basal III light, rest dark. Antennae longer than body, 2.62 mm. with segments measuring I, 0.14 mm.; II, 0.07 mm.; III, 0.62 mm.; IV, 0.48 mm.; V, 0.41 mm.; VI (base), 0.1 mm.; spur 0.8 mm. No sensoria on

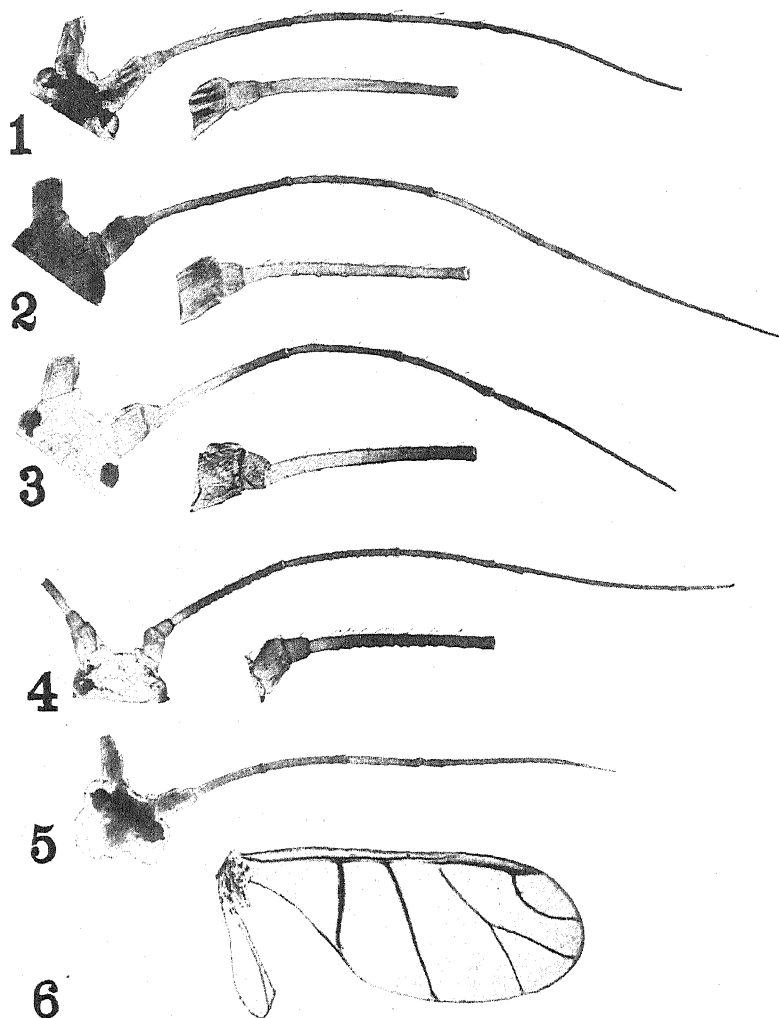
III or IV, the usual terminal one of V and the terminal one with group of 6 crowded sensoria present on VI. Eyes red. Ocular tubercles prominent. Beak 0.43 mm., extending to 3rd coxae. Thorax and prothorax light green. Legs with femora light proximally and dark and glistening distally; tibiae dark at proximal and distal ends with light space between; tarsi black. Abdomen light green with dark ring at base of cornicle. Cornicle black, shaped and imbricated about as in the winged viviparous form. Cornicles 0.32 mm. Cauda light yellowish brown, ensiform, upcurved, 0.24 mm. Total length of body, exclusive of antennae 2 mm.; width .99 mm.

*Apterous oviparous female*.—Head light brown. Antennae black except basal III. Antennae longer than body, 2.62 mm. with segments measuring I, 0.15 mm.; II, 0.08 mm.; III, 0.6 mm.; IV, 0.48 mm.; V, 0.42 mm.; VI (base), 0.13 mm. Spur 0.76 mm. No sensoria except the terminal one of V and the terminal one of VI accompanied by crowded group of 6 marginal sensoria. Ocular tubercles prominent. Beak 0.44 mm., extending just caudad of 3rd coxa. Thorax light green. Legs colored as in winged viviparous form. Hind tibiae thickly set with sensoria. Abdomen light green with dark patch around cornicle. Cornicles dark brown, shaped and imbricated about as in the viviparous forms. Cauda light yellowish, ensiform, length 0.2 mm. Total length of body, exclusive of antennae, 2.25 mm. Width 1.01 mm.

*Winged male*.—Head light yellowish brown. Antennae black, longer than body, length 2.65 mm. with segments measuring I, 0.12 mm.; II, 0.08 mm.; III, 0.56 mm.; IV, 0.51 mm.; V, 0.41 mm.; VI (base), 0.12 mm.; spur 0.85 mm. Sensoria thickly set in III, IV and V. Terminal sensoria of V and group of VI similar to those of the other 3 forms. Ocular tubercles prominent. Beak 0.37 mm. reaching nearly to 3rd coxa. Thorax glistening brown. Prothorax light green. Wings with venation as in the alate viviparous form. Wings expand 4.95 mm. Legs colored as in alate viviparous form. Abdomen light green. Cornicles dark and strongly imbricated as in the other forms. Cornicles more uniformly cylindrical than in the other forms. Cauda lighter than abdomen, ensiform, about the length of tarsus, 0.12 mm. Total length of body, 1.125 mm.; width 0.56 mm.

The entire life cycle of the colonies observed in Maine is passed upon the Canadian or showy tick-trefoil, *Desmodium canadense* DC. The species reproduces upon the trefoil during the summer, and during July the colonies of apterous and alate viviparous forms thickly crowd the tips of the branches and the ventral surface of the leaves which become badly twisted and curled. From the middle of August to the middle





MICROPARSUS VARIABILIS PATCH.

of September the true sexes,—the winged males and the apterous oviparous females are abundant. Females kept in captivity deposit eggs upon the dried leaves and stems of the trefoil. A careful field examination of the infested plants late in September results in finding some eggs upon the stems and crumbled leaves of the trefoil, but the eggs are much more numerous upon the sticks and stones immediately about the base of the infested plant.

The colonies which furnish data for this species were found along a sandy stretch near Veazie, Maine, where the species has been exceedingly abundant for the past three seasons.

There is something indescribably distinctive about the species when observed even with the unaided eye. The first impression they give the finder is that "here is something out of the ordinary in the aphid line," before a detailed examination is made.

The large per cent. of abnormal veins both in the males and the alate viviparous forms in each season's collection made the examination of a great number of specimens necessary in deciding upon the type of venation normal for this species.

Too much stress should not be laid upon the colors of aphids as they vary more or less, the more recently molted individuals being in general paler than the others. Neither can the antennal measurements be taken as absolute as different individuals vary both as to the length of the entire antennae and as to the relative length of the different segments.

However, both the color scheme and the antennal measurements are a great convenience in the sum of characters, if given their relative values.

#### EXPLANATION OF PLATE XIX.

1. Head and antenna of apterous viviparous form.
2. Head and antenna of alate viviparous form.
3. Head and antenna of apterous oviparous female.
4. Head and antenna of male.
5. Head and antenna of pupa.
6. Wings, showing the type of venation most frequent for this species.



## Two new Caddice Flies.

By NATHAN BANKS.

### **Macronema carolina** n. sp.

Head brown, shining, warts dull black, circular; antennae blackish; palpi yellow; legs yellow, anterior tibiae black toward tip; prothorax yellow, thorax and abdomen black; fore wings dark brown, marked with pale patches having golden hair; a curved oblique mark, near base, an oblique costal mark, two larger costal marks near the pterostigma, both triangular, a half band in middle below the last of these, a larger triangular one on the posterior margin beyond, a broader one before with a basal extension, and a small spot in the otherwise uniformly dark apex of the wing. Hind wing blackish at apex. Male antennae about twice as long as wings. Expanse 23 mm.

Two specimens from Southern Pines, N. Car., (Manee).

### **Notiomysia ornata** n. sp.

Head yellow, a patch of black hair under each antennae; a few bristles in middle of front, a few on side near each eye arising from a small wart, and some from the posterior depressions, rest of vertex smooth, shining, and flattened as in *N. mexicana*; antennae widely separated, black, some golden hair on the first joint beneath; palpi long, black, black-haired, last joint longer than in *N. mexicana*, as long as third joint, legs yellow, tarsi black, and apical part of middle and hind tibiae black, spurs black, tarsi and tibiae very hairy; abdomen yellowish. Wings dark brown, with streaks and spots of golden hair; a streak below radius, a spot at the stigma, a streak in the third apical cell, with a basal extension below, a streak in the second subapical cell, a spot over arculus extending above, two streaks from this spot reach toward base, where they are broader. Expanse 25 mm.

One from Brownwood, Texas, August.

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A BLACK ARMY WORM.—V. K. Chesnut, in his "Plants Used by the Indians of Mendocino County, California" (Contrib. from the U. S. Nat. Herb., vol. VII, No. 3, 1902), states under *Fraxinus oregana* Nutt. (Oregon Ash, or the Pok of the Indians; p. 378): "The ash leaf is a favorite food of a little black army worm which has white spots on its back. The worm is consumed in large quantities as food by several of the tribes in Round Valley." Conceding that the larva is that of one of the army worm moths, entomologists should be duly grateful for having had at last brought to light some practical use for this noxious pest.—KARL R. COOLIDGE.

## A new species of the genus *Paroxya* from Bermuda (Orthoptera).

By JAMES A. G. REHN.

Included in a very interesting collection of Orthoptera made in Bermuda in the winter and spring of 1908 and 1909 by Mr. Frank Morton Jones, is a remarkable new species of the genus *Paroxya*. It is not at all closely related to any of the previously known species of the genus, with specimens of all of which it has been compared except the Bahaman *P. dissimilis* Morse. In the form of the cerci the new form is distinctly different from the other members of the genus, while the brachypterous condition is only shared by the otherwise very different *P. hoosieri*.

### *Paroxya bermudensis* n. sp.

Types: ♂ and ♀ taken in coitu; South Shore, Warwick Parish, Bermuda, January 15, 1909. Coll. by F. M. Jones. (Acad. Nat. Sci., Phila.)

Size rather small for the genus; form moderately elongate. Head with the occiput well rounded, hardly (♂) or distinctly (♀) elevated dorsad of the level of the disk of the pronotum, considerably and regularly declivent from dorsad of the middle of the eyes to the apex of the fastigium, the interspace between the eyes slightly less than half the fastigial width; fastigium with the margins very slightly acute-angulate, the immediate apex sub-truncate, narrowly rounding into the frontal costa, the interocular space and the fastigium broadly and shallowly sulcate; the angle of the fastigium and face obtuse when seen from the side, the portion of the facial line dorsad of the antennae sub-vertical when seen laterad, the portion ventrad considerably retreating; frontal costa subequal in width, though slightly narrowed dorsad in the male, reaching the clypeal suture, roughly biseriate punctate dorsad of the ocellus, deeply and broadly sulcate ventrad, eyes rather protuberant in both sexes, though slightly more so in the male than in the female, broad ovate in shape, flattened cephalad, the length nearly twice (♂) or more than half again (♀) that of the infra-ocular sulcus; antennae about one-half (♀) to four-fifths (♂) as long as the caudal femora. Pronotum with the cephalic margin of the disk arcuato-truncate, caudal margin very broadly obtuse-angulate, the greatest (caudal), width of the disk contained nearly twice (♂) or one and three-

eighths times (♀) in the length of the same; median carina very distinct, uniform, severed by the principal sulcus slightly caudad of the middle; lateral angles distinct but rounded, regularly and distinctly (♀) or slightly (♂) divergent caudad; lateral lobes with the dorsal length considerably exceeding the greatest depth, the caudal margin quite oblique. Tegmina three-fourths as long as (♂) or but slightly shorter than (♀) the dorsal length of the pronotum, ovate sub-lanceolate, the apex more acute in the female than in the male, the greatest width contained one and one-half (♂) to one and two-thirds (♀) times in the length of the same; venation prominent; dorsal margins separated but little in the male and by a space proportionately somewhat greater in the female. Apex of the male abdomen hardly at all recurved; furcula absent, the area where they are usually attached being narrower than the lateral portions of the terminal dorsal abdominal segment; supra-anal plate moderately elongate-lanceolate, with a well-defined median sulcus in the proximal two-thirds, while the lateral portions are broadly and deeply excavate the entire length of the plate; cerci elongate, reaching very slightly beyond the apex of the supra-anal plate, regularly tapering to hardly more than half the proximal width in the median section, then spatulate, expanding to a width nearly equal to that proximad, the ventral margin subtruncate, the dorsal strongly arcuate, the distal obliquely subtruncate, the lateral face of the expanded portion shallowly excavate, the whole cercus regularly, but not strongly, curving toward the median line; subgenital plate broad and shallow, the length of the same distinctly less than that of the apical margins, the latter broadly arcuate, a distinct subapical tubercle present, well separated from the apical margins. Ovipositors of the female rather slender. Prosternal spine retrorse, conical; interspace between the mesosternal lobes very slightly longitudinal (♂) or subquadrate (♀), metasternal lobes distinctly separated in both sexes. Caudal femora rather slender, hardly (♀) or distinctly (♂) exceeding the apex of the abdomen, pattern of the pagina regular and close; caudal tibiae with ten to eleven spines on the lateral margins.

General colors mars brown, marked with ecru drab on the face, sides of pronotum and pleura sprinkled and blotched with seal brown. A narrow line, ecru drab in the female, yellowish in the male, runs caudad of the dorsum of the eye a variable distance along the lateral angles of the pronotum, while the face and genae are rather irregularly blotched, aside from a pale bar, ecru drab in the female, more yellowish in the male, which extends from ventrad of the eye dorso-caudad, tapering, extending to the intersection of the lateral angles by the principal sulcus, dividing the seal brown blotch of the

dorsal half of the prozona of the lateral lobes; a poorly-defined blotch of the same pale color lies caudad of the dark area, these pale portions being much less clearly defined in the male than in the female. Tegmina mars brown. Abdomen dark, laterad on the proximal segments in the male, generally lined, streaked and blotched in both sexes. Caudal femora of the general colors with very slight indications on the dorsal face of transverse bars, the genicular arches and bases of the lobes seal brown, the ventral sulcus and ventro-lateral face burnt carmine; caudal tibiae pale bottle green, more or less speckled and clouded with brownish, particularly in the proximal half, spines blackish on their apical two-thirds. Eyes tawny-olive; antennae cinnamon.

## MEASUREMENTS.

	♂	♀
Length of body .....	17.2 mm.	24.5 mm.
Length of pronotum .....	4. "	5.5 "
Length of tegmen .....	3. "	4.2 "
Length of caudal femur .....	10.2 "	13.8 "

The types are the only adults of the species seen, but immature individuals apparently belonging to this species were taken April 18 and May 8 and 11.

In the rather peculiar coloration, the presence of a sub-apical tubercle on the sub-genital plate and the absence of the furcula this species holds a unique position in the genus and a sub-genus for its reception may have to be erected.

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A CAT ENTOMOLOGIST.—Last summer I spent several weeks at North-east Harbor, Maine, and collected *Sphingidae* quite assiduously, hoping particularly to find *S. canadensis*. The commonest species there is *S. kalmiae*. I took also *chersis*, *eremitus*, *A. choerilus*, and *H. diffinis* and *cimbiciformis*. In the local nursery, where the proprietor, Mr. Rothe, kindly allowed me to prowl about, specimens of all of these were fairly abundant at such flowers as Sweet William, "pinks," Larkspur and Snapdragon. One evening I noticed, among the flower-beds, a cat, of the "common or garden" variety, whose movements were so unusual as to attract attention. A little observation showed that she was catching and eating moths, sometimes jumping into the air to strike down one that hovered above reach. With her vastly keener vision, she could discover them much better than I, and her actions showed that she was quite accustomed to procuring that sort of evening meal. I did not succeed in taking *canadensis*, but think it not unlikely that the cat did.—W. C. Wood.

## Notes on W. R. Walton's "Illustrated Glossary of Chaetotaxy and Anatomical Terms Used in Describing Diptera."

By G. H. VERRALL, Newmarket, England.

An illustrated glossary is a first-rate idea, and should be of extreme value to (at any rate) beginners in any study; consequently Mr. Walton deserves the thanks of Dipterologists. Such a glossary should, however, be fairly complete and should be very accurate, because it is liable to be accepted as "gospel," and therefore before being accepted should be subjected to the severest criticism.

With all good will towards Mr. Walton's Glossary and with a desire to make it more complete and consequently more useful I feel it desirable to make every criticism possible to my knowledge, especially as various misprints and minor flaws occur, as well as numerous omissions and (in my opinion) errors which should not be perpetuated. The whole article seems also to have been compiled for "Tachinologists" only, and not for Dipterologists in general.

\* \* \* \* \*

Page 308, near middle and 314, near bottom:

I thought that Osten Sacken, Dr. Sharp, and Girschner had completely disposed of the term "Calypter," and that we should never see it used any more.

Page 310, line 10:

"Cheeks." We have a common phrase of "cheek by jowl," which is exactly equivalent to the German "Wangen und Backen;" according to these Mr. Walton's "cheeks" should be "jowls"—a term omitted by him though used by American writers—and his "Gena" should be "cheek" or "side-cheek." As Mr. Walton says, "It seems deplorable that there should be in general use several names for any one part," but who would use "parafacial" for "side-cheek?"

Page 310, line 20:

The word "Head" must have occurred here by mistake and should be omitted, but in place of it "Epicephalon" mentioned on page 313, line 16, should be defined.

Page 311, line 4:

The "facio-orbital" bristles are apparently only a continuation of the fronto-orbital bristles on to the "genæ" (or side-cheeks), as mentioned under "Frontal bristles."

Page 311, line 9:

"Front." The term "Frons" is now superseding this, and avoids many a misinterpretation. If we use "vertex," "occiput," etc., we surely can use "frons."

Page 311, line 30:

"Frontal triangle." This is not figured, but is very frequently and expressively used in many groups of the Diptera.

Page 312, line 3:

"Gena." See note above on "Cheeks."

Page 312, line 7:

"Genovertical plate." This appears to me to be a new name for the well-known "Frontal Orbit," which is not included in the glossary.

"Jowls" should be included and defined here.

"Median vitta" is a term used on page 311, line 17, but not defined here.

Page 312, line 24:

"Occipito-lateral bristles." These do not appear to be figured.

Page 312, line 33:

The ocellar bristles are not always diverging and pointing forward.

Page 313, line 1:

"Orbits." Alphabetically this word will follow "Oral," and through this criticism may appear trivial; similar slight errors occur in other places which might well have been avoided.

Page 313, line 22:

"Peristoma" and "Epistoma" are not the same, and are by no means obsolete terms.

"Peristomium" is a strange term to me, and not included here though mentioned on page 314, line 13.

Page 313, line 26:

"Cillia" is a misprint for "cilia," though a similar error occurs twice on Plate xv in the word "cilliate." "Ptilinum" is not defined, though frequently mentioned.

Page 313, line 37:

"Transfrontals." These are bristles unknown to me and not satisfactorily figured.

Page 314, line 22:

"Acrosticals." Here and elsewhere this should be spelled "acrostichal."

Page 314, line 26:

"Calypsters." Even if this term be abandoned in favor of "squamæ" still definitions should be given of the alar and thoracal pairs, as these are now known to show valuable distinctive characters. The term "frenum" should also be defined.

Page 314, line 35:

If "postsutural" be used surely "presutural" is also admissible.

Page 315, line 6:

The Hypopleura is not "between the metapleura and pteropleura." Of course "peteropleura" is a misprint. Mesonotum is not defined though mentioned elsewhere.

Page 315, line 17:

The "mesopleural row" of bristles is not always "near the angle formed by the dorsopleural and mesopleural sutures," but may extend all down the back margin of the mesopleura.

Metanotum is not defined, though mentioned under metapleura.

Page 315, line 22:

"Metapleura, the sides of the metanotum, a more or less swollen space." This definition leaves it very doubtful whether "metapleura" is a plural or singular noun; it might be either but I have always used "pleura" as singular and "pluræ" as plural. The metapleural bristles are very important in the *Asilidae*.

Page 315, line 29:

"Notopleural or dorsopleural suture." This is not well defined; it runs from the lower part of the humerus to the root of the wing, separating the mesonotum from the mesopleura.

Page 315, line 32 and page 315, line 34:

Presumably Post alar should be Postalar.

Page 315, line 36:

The "Posthumeral" bristles are distinct from the "Intra-humeral."

Page 316, line 12:

"Propleura." This is a new term to me. Is it not the "Prothorax" which is not mentioned at all? Neither are the prothoracal and stigmatal bristles (Becker) mentioned.

Page 316, line 17:

"Proalar bristle." This is not in its alphabetical place, and is not the "Pro alarborste" of Stein but is presumably his "Präalarborste," which I suppose we should call Præalar (or Prealar) bristle. The figure, however, appears to refer to a Posthumeral bristle.

Page 316, line 26:

"Pteropleural bristles" are by no means rare

Page 316, line 31:

"Scutellar bristles, marginal." These bristles, which seldom form a "distinct row" may point in various directions.

Page 317, line 18:

For "Trichostical" read "Trichostichal."

Up to this point I have tried to mention every correction which I could suggest, but when I come to "Legs" and "Wings" the omissions and inaccuracies are so numerous that I cannot take them in detail.

Under "Legs" I presume the first two paragraphs should read continuously as one. No mention is made of "front," "anterior," "middle," "hind," or "posterior" legs, nor is any reference given to the surfaces known as "antero-dorsal," "antero-ventral," "postero-dorsal," "postero-ventral" or even "anterior,"



"posterior," "dorsal" or "ventral." Other terms have been used by German writers, but at least some reference is necessary as these distinct surfaces are very important in distinctive characters. The "Mesal surface of the leg. That surface of the front and hind legs which is naturally turned toward the body" conveys no meaning to me. "Preapical bristle" applies to a bristle on the femora in some families. The "Tarsus" may be said to be almost invariably composed of five joints in the Diptera.

Under "Wings" almost all definitions are subordinated to the figure, and consequently I will only remark that obviously the *First* Longitudinal Vein is the *Second* and so on; the first posterior cell is often closed and consequently not bounded by the outer margin of the wing, while the (so-called) "Apical Cross-vein" is only a continuation of the (so-called) "Fourth Longitudinal Vein," and equally the "Posterior Cross-vein" is a continuation of the (so-called) "Fifth Longitudinal Vein." American writers have probably done more than any others in describing and naming the homologies of venation, and it seems unfortunate that *all* that work should be ignored.

I am afraid that I must come to the conclusion that the "Glossary" should be revised and considerably developed, in at least the parts devoted to "Legs" and "Wings" before it can be accepted as a standard, and that the European writers (especially Girschner) upon Chætotaxy should be studied and compared.

In conclusion I can say that I welcome the paper, but I offer these criticisms from fear that all the statements contained therein may be accepted as "Gospel" unless attention be quickly drawn to inaccuracies and serious omissions.



Mr. Edw. M. Ehrhorn, at present Deputy Horticultural Commissioner of California with Entomological Inspector's duties stationed in San Francisco, has received and accepted the appointment of Superintendent of Entomology of the Hawaiian Board of Agriculture beginning October 1st. Mr. Jacob Kotinsky resumes the post of Assistant Entomologist with the Board.

## An Observation on the Intelligence of *Junonia*.

By WILLIAM SCHRADER, Los Angeles, Cal.

I have made breeding experiments with a number of different butterflies, and found *Junonia coenia* one of the tamest, and most intelligent butterflies in captivity. It seems not to be known exactly for what purpose the antennae of butterflies are used. I observed while feeding butterflies with honey, that *Vanessa* bend their antennae close to the ground several times, probably to feel, or to smell. But *Junonia coenia*, when I put it behind red paper, ran over the surface, and used its antennae very often, bending down to the paper, and when it came to a darker red place, stopped at it, and bent several times on that darker place; then remaining on the lighter place, turned four times with the head to the right in a perfect circle, and exactly four times back to the left, on the same spot; and later did the same thing once more, six times round to the right, and exactly six times back again. Is *Junonia* able to count, who knows? An explanation for turning around so often, may be found in the fact that *Junonia* rests with its tail to the sun, and as my red colored paper was placed vertically between the butterfly and the sun, it was puzzled in what direction to rest.

Professor G. H. Parker believes the object of the creature thus turning its tail to the sun is to display its coloring to the greatest advantage. And he says further: When a butterfly with cryptically colored under-side rests upon a flat surface in bright sunshine its shadow is often more conspicuous than the insect itself, so that economy of shadow may be a valuable means of protection. I, for my part, see things more in a practical way, and believe that the butterflies turn their heads from the sun for no other purpose than to see better. Would anybody who looked out for a friend or enemy look in the direction of the sun? I believe not, and I think a smart or highly developed butterfly learns how to see best the same as other animals. To return to the antennae, I believe they have other functions than that of smell and hearing, as some scientists assert, as nothing to smell or hear was on the red colored paper,

and it is certainly worth while to make further experiments in that line of work.

In the last two summers I could not obtain a pair of *Junonia* for breeding purposes as this butterfly is not very abundant near Los Angeles.

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### Geometrid Notes.

By JOHN A. GROSSBECK.

The following brief notes indicate changes in the standing of various Geometrids and are recorded in the belief that they will be of some value to others working in the group:

*Sciagraphia orillata*, now placed as the synonym to *S. continuata*, is a species strictly indigenous to the Western States, while *continuata* is an Eastern species whose Western limit probably does not extend beyond the Mississippi River in the north and the Rocky Mountains in the south. The two species may be separated at a glance by the course of the extradiscal line, which in *orillata* is evenly incurved below vein  $M_1$ , while, in *continuata* it is sinuous below this vein. Also in *orillata* this line is obsolete or only faintly indicated immediately above  $M_1$ , while in *continuata* there is no appreciable attenuation at this point. Further, in *orillata* the intradiscal line vanishes within and above the cell, and in *continuata* is pronounced and unbroken from the costa to the inner margin; also, this line is much more oblique in the former species. Superficially, especially when viewed in series, the two species are exceedingly unlike each other, and indeed there are two valid species whose position is directly between them.

The synonyms of the two species divide as follows:

*Sciagraphia continuata* Walk.

= *strigularia* Walk.

*Sciagraphia orillata* Walk.

= *excurvata* Pack.

= *curvata* Grote.

= *cruciata* Grote.

Packard's figure, Monograph pl. ix, f. 75, is a good representation of *S. continuata*.

*Atrofasciata* Pack. listed as a variety of *continuata* may possibly be a distinct species, but if not is a form of *continuata* as here limited.

*Cymatophora tenebrosata* Hulst. In the Proc. Ent. Soc., Wash., x, 87, 1908, I referred several specimens of a *Cymatophora* received from Dr. Dyar to this species, my determination being based on a lightly colored type in the Hulst collection. Recently I received two specimens of a supposedly new *Macaria* from Dr. Barnes and soon after was surprised to see the species in the Brooklyn Institute of Arts and Sciences labeled as types of *tenebrosata*. A reference to Holland's figure of a male type (Moth Book, pl. xliii, f. 50), which is not so well delineated as most of the insects in that book, shows that it too belongs to *Macaria*. My first impression was that I had made a mistake in my comparison with the type in the Hulst collection, but a renewed examination shows that while it resembles the other types it is a true *Cymatophora* and conspecific with the specimens named for the National Museum. In his description of *tenebrosata* Hulst mentions the head and collar being yellow-ochreous, a character that applies only to the *Macaria* species; I therefore propose to hold the name on that form, and the note in the Proc. Ent. Soc. Wash., referred to will then apply to an undescribed species of *Cymatophora*.

*Cymatophora deceptata* Hulst (Trans. Am. Ent. Soc., xxiii, 334, 1896) described from New York is a much abraded female example of *Orthofidonia exornata* Walk.

Mr. Henry L. Viereck of the Division of Entomology, Washington, has called my attention to the preoccupation of Hulst's generic name *Sympherta* (Trans. Am. Ent. Soc., xxiii, 338, 1896) in the Hymenoptera where it is proposed by Förster (Verh. d. Naturh. ver. per. Rheinl., xxv, 196, 1868) for a genus of Ichneumonidæ. *Sympherta*, of which *tripunctaria* Pack. is type is based on sound structural characters so I propose for the genus the name *Gladela*.

I might also add in this connection that *Sympherta coloradensis* Hulst (Trans. Am. Ent. Soc., xxiii, 338, 1896) is not congeneric with *tripunctaria* but is referable to *Cymatophora*.

*Slossonia latipennis* Hulst (Can. Ent., xxx, 217, 1898). The type of this species is a single female in the U. S. National Museum. In examining the museum collection in 1907 through the courtesy of Dr. Dyar, I found this type to be a much faded specimen of our common *Anaploides remotaria* Walk.

*Caberodes minima* Hulst (Can. Ent., xxx, 219, 1898). Though originally described as a species "quite different in appearance from the ordinary *Caberodes*" Hulst nevertheless lists it as variety *b* of our common *C. confusaria* in Bull. 52, U. S. N. M. Besides being little over half as large as average sized specimens of that variable species it may be at once distinguished by the course of the extradiscal line which in *confusaria* always extends almost to the apex before bending in toward the costa, while in *minima* this line does not terminate further out on the costa than two-thirds the length of the costa from the base. It has other minor differences, and altogether the species are as distinct from one another as two species may well be. The conclusion of the specific distinctness of *minima* was reached from the type alone but I have now two additional specimens from Dr. Barnes which exhibit the differences noted above even more strongly than does the type.

*Selidosema sericeata* Hulst (Can. Ent., xxx, 191, 1898). This is identical with the species previously described by Grote as *Phasianae colata* (Papilio I, 167, 1881) and later referred by Hulst (Ent. Am., II, 224, 1886) as a synonym of *Sciagraphia nubiculata* Pack. The two do not belong in the same genus. *Nubiculata* is a true *Sciagraphia*. *Sericeata* is now placed with *correllatum* Hulst, a near relative, in the genus *Selidosema*. This is hardly the final resting place for either form, but until a complete revision of the species comprising the Boarminæ group is made it will perhaps be as well to retain them in that genus.

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Ere many days have vanished, we  
Will hear the gay mosquito call,  
"I'm busier than the busiest bee,  
And yet I get no praise at all."—*Judge*.

## Standards of the number of eggs laid by Insects—VIII.\*

Being averages obtained by actual count of the combined eggs from twenty (20) depositions or masses.

By A. ARSENE GIRAULT.

9. CHIONASPIS AMERICANA Johnson.							
No.	Date 1908	No. counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range	
1	Nov. 14th	103	103	103.	53	160	
2		73	176	88.			
3		56	232	77.3			
4		100	332	83.			
5		70	402	80.4			
6		53	455	75.8			
7		119	574	82.			
8		94	668	83.3			
9		100	768	85.3			
10		124	892	89.2			
11		77	969	88.			
12		79	1048	87.3			
13		160	1208	92.9	160		
14		139	1347	96.2			
15		121	1468	97.8			
16		79	1547	96.6			
17		94	1641	96.5			
18		82	1723	95.7			
19		97	1820	95.7			
20		127	1947	97.3			
			1947	97.3	160 53	107	Finals

The egg masses of this species were collected from eleven trees on the campus of the University of Illinois, Urbana, Illinois; the eggs were those of the winter generation. Willis Grant Johnson under the original description of this insect in 1896 (Bull. Illinois State Laboratory of Natural History, Springfield, 1898, iv (1892-1897), p. 392), states that the average number of eggs is 105. In Iowa, Wilmon Newell (Bull. No. 43, Iowa Agric. Exper. Station, Ames, p. 153) in 1899 gives the number as being between 40-90 eggs. No data are given by either.

\* For the first seven of this series, see ENT. NEWS, 1901, p. 305; 1904, pp. 2-3; 1905, p. 167; 1906, p. 6; 1907, p. 89; 1908, pp. 4, 383.

## 10. CHIONASPIS PINIFOLLE (Fitch).

No.	Date 1908	No. counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range	
1	Nov. 14	38	38	38.	19		
2		19	57	28.5			
3		36	93	31.			
4		33	126	31.5			
5		41	167	33.4			
6		28	195	32.5			
7		28	223	31.8			
8		20	243	30.3			
9		48	291	32.3			
10		41	332	33.2			
11		42	374	34.	72		
12		26	400	33.3			
13		72	472	36.3			
14		70	542	38.5			
15		64	606	40.4			
16		39	645	40.3			
17		35	680	40.			
18		46	726	40.3			
19	Nov. 16	23	749	39.4			
20		29	778	38.9			
20			778	38.9	72 19	53	Finals

These egg masses were taken from the leaves of several pine trees on the campus of the University of Illinois at Urbana. The eggs are of the wintering generation. No definite record of the number of eggs deposited by this species has been found in the literature.

## 11. CHIONASPIS SALICIS = NIGRAE (Walsh).

No.	Date 1908	No. counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range	
1	Mch. 20	85	85	85.	53	174	
2		126	211	105.5			
3	Mch. 22	68	279	93.			
4		141	420	105.			
5		145	565	113.			
6		91	656	109.3			
7		91	747	106.7			
8		104	851	106.3			
9		76	927	103.			
10		53	980	98.			
11		99	1079	98.			
22		131	1210	100.8	174		
13		159	1369	105.3			
14		84	1453	103.7			
15		124	1577	105.1			
16		174	1751	109.4			
17		54	1805	106.1			
18		84	1889	104.9			
19		93	1982	104.3			
20		118	2100	105.0			
20			2100	105.	174 53	121	Finals

The egg masses were collected at Urbana, Illinois, on willow. I have not been able to find statements in the literature concerning the number of eggs deposited by single females of this species. The eggs were those of the winter generation.

12. *LEPIDOSAPHES ULMI* (Linnaeus).

No.	Date 1908	No. counted per mass	Successive Totals	Av. per Egg Mass	Max. Min.	Range	
1	Feb. 21	75	75	75.		120	
2	Feb. 23	67	142	71.			
3		109	251	83.6			
4		100	351	87.7			
5		85	436	87.2			
6		94	530	88.3			
7		87	617	88.1			
8		120	737	92.1	120		
9		64	801	89.			
10		89	890	89.			
11	Mch. 18	80	970	88.1			
12	Mch. 20	83	1053	87.7			
13		90	1143	87.9			
14		72	1215	86.7			
15	Mch. 21	83	1298	86.5			
16		91	1389	86.8			
17		48	1437	84.5	48		
18		73	1510	83.8			
19		89	1599	84.1			
20		113	1712	85.6		48	
20			1712	85.6	120 48	72	Finals

The bodies of the females containing these egg masses were taken from several Carolina poplar trees along the streets of the city of Urbana, Illinois, during the early part of 1908. The literature of this coccid contains frequent statements concerning the number of eggs deposited, all of which approximate the results here obtained, excepting that the range is lower; these statements are, however, indefinite to the extent that the data upon which they are based are in most cases lacking.

## A genus of Eumenid Wasps new to North America.

By S. A. ROHWER, Boulder, Colo.

### *Psiloglossa simplicipes* n. sp.

Female: Length 6 mm. Clypeus rather large, narrowed at the apex where it is deeply emarginate, the lobes rounded at the apex and about the same width throughout; the surface of the clypeus is closely granular and with a few large punctures intermixed. Mandibles short, stout, with a rather large inner tooth, the apex is obtusely rounded and at some angles seems to be notched, so when the mandibles are not worn perhaps they would be tridentate; but not quadridentate. Front rather coarsely granular, except a shining area between the antennae. Vertex shining, sparsely punctured; the back of the occiput is closely punctured. The vertex with two shining tubercles which are low and rounded. Ocelli in a low triangle; the anterior ocellus much the largest. Antennae rather strongly clavate; the first joint of the flagellum about as long as 2 and 3 together. Dorsulum and scutellum coarsely granular; scutellum large and flat, ob-



tusely rounded and somewhat produced posteriorly. Mesopleurae striato-granular. Metathorax emarginate posteriorly and the metapleurae are narrowed beneath; the posterior face with a faint channel down the middle, the surface striato-punctate; metapleurae shining; metanotum rugose. Legs short and rather slender; the middle tibiae with two apical spurs; *the tarsal claws simple*. Radial cell broadest opposite the second transverse cubitus; with a short appendiculation at the apex. The second cubital cell narrowed above, about a third as wide on the radius as the third cubital. The first recurrent received by the second cubital cell about the length of the second transverse cubitus from the second transverse cubitus; the second recurrent received by the third cubital cell about the length of the second transverse cubitus from the second transverse cubitus. The transverse median, which is received a little before the basal nervure, is not straight, but is strongly bent toward the apex of the wing. The transverse median of the hind wings is straight, perpendicular, and interstitial with the transverse cubitus. Abdomen sessile, somewhat the shape of members of the genus *Oxybelus*; shining, the first segment sparsely punctured, the second and following segments with distinct, separate punctures, closer than those on the first segment; there is no pygidial area. Black; two transverse spots on the top of the clypeus, a round spot at the summit of each eye, pronotum, margins of the tegulae, spot below the tegulae, spot before the scutellum, spot on the scutellum, an even band on the posterior margin and sides of the first segment, a band on segments 2, 3, and 4, widened greatly at the sides and emarginate between the sides and the middle, *cream-colored*. Middle of the tegulae brown; flagellum slightly reddish beneath. Leg below the trochanters *light ferruginous*, the apex of the anterior femora beneath, and the four posterior tibiae exteriorly *cream-colored*. Wings clear hyaline; venation brown to black. Head and thorax with a little silvery pile.

*Type locality*: Las Cruces, N. M. One specimen collected August 31, at flowers of *Solidago canadensis* by C. H. T. Townsend. I am much indebted to Prof. T. D. A. Cockerell for the specimen, and for offering some helpful suggestions.

This is a most remarkable little wasp. I am by no means sure that it belongs to the genus *Psiloglossa* Saunders (= *Stenoglossa* Sauss.), but place it there for the present. The simple tarsal claws would seem to put it in the subfamily Vespinae. It is not anything like most of these however, while it does resemble some species of *Odynerus* in general habitus. The genus *Psiloglossa* has not before been reported from the Western Hemisphere.

### Some Habits of Empididae.

By W. L. McATEE, U. S. Biological Survey.

On March 31, 1909, near Winston-Salem, N. C., the writer had an opportunity to make some slight observations on the feeding and mating habits of *Empis spectabilis* Loew. Apparently the habits of this species have not been described, and indeed, notes on the habits of Empididae as a group are scarce. We will review briefly what has been written on Empids of the United States. In the Proceedings of the Entomological Society of Washington, Vol. II (1890-1892) 1893, pp. 146-147, Mr. E. A. Schwarz described the feeding habits of a species of *Syneches* which caught little gnats and other minute Diptera. Of most interest in the present connection is their manner of perching while devouring the captured insects, which is described as follows: "Holding their prey between the legs, and their body being in vertical position, they slowly fly toward the nearest bush, and, without alighting, most dexterously manage to take hold of the edge of a leaf with the claws of the right or left front leg. The long and very sharp claws are well adapted for taking a firm hold on the surface of the leaf, and the long pulvilli assist in the operation by pressing on the edge of the under side of the leaf. Thus vertically suspended by a single leg, the fly uses its five free legs for manipulating the gnat. Within ten or fifteen seconds it has sucked out its prey, then drops the same and flies away. On a single shrub alongside a road I could see at the same time thirty or more specimens of the fly all suspended in exactly the same way, while numerous others were constantly going or coming."

In the American Naturalist, Vol. xxxiii, 1899, pp. 809-812, J. M. Aldrich and L. A. Turley describe the interesting habits of a balloon-making Empid (*Empis acrobatica* Melander). At the time of mating the male of this species carries an ovoid frothy bag, and it was observed that "in nearly every case there was a small fly pressed into the front end of the balloon, apparently as food for the *Empis*, as the attached species were partly Chironomus and partly Oscinids, and other Acalyptrate Muscids." While flying about with this balloon the male

is alighted upon by a female and copulation ensues. "After copulation had begun, the pair would settle down towards the ground, select a quiet spot, and the female would alight by placing her front legs across a horizontal grass blade, her head resting against the blade so as to brace the body in position. Here she would continue to hold the male beneath her for a little time until the process was finished. The male, meanwhile would be rolling the balloon about in a variety of positions, juggling with it, one might almost say. After the male and female parted company, the male immediately dropped the balloon upon the ground."

Mr. A. L. Melander notes\* quite different mating habits in another Empid, namely *Hilara trivittata* Loew, which lives about brooks. "When copulating the pair float on the surface, and are swiftly carried down stream." Mr. H. S. Barber tells me he has seen a species of this family, probably of the genus *Empis*, in California which remains on the wing throughout the period of copulation.

The behavior of the flies observed by the writer presents interesting analogies to that noted in the case of *Empis aerobatica* by Messrs. Aldrich and Turley. In their article as well as that by Mr. Schwarz, it is stated that the Empids suspended themselves by the forelegs, and I noted the same with respect to *E. spectabilis*, both when feeding singly and when copulating. This species, however, did not brace the head against the support but hung under it, the long front legs passing up on each side of the thorax, the tarsi being curved over the objects clung to. The latter were of various kinds, twigs of young oaks, hickories, sourwood and blades of the common brown-sedge (*Andropogon*) being utilized. Aldrich and Turley remark that the female was the upper member of the breeding pair and grasped the support. In *Empis spectabilis* the position of the sexes is reversed. About four o'clock in the afternoon, in a warm, quiet spot, hundreds of pairs of these flies were seen clinging to the objects above mentioned, the male of each couple grasping the support with the first

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\*Trans. Am. Ent. Soc. 28, 1902, p. 200.

pair of legs, and his partner with the other two pairs. In every case observed the female held an insect in her legs, and was busily engaged in devouring it. Her long stiff proboscis was run through and through the prey, apparently with the greatest ease, while she turned it about with her legs, reminding one of the balloon juggling practiced by the male *Empis aerobatica*. If a pair were forced from their perch they flew off and were able to re-alight without interrupting either breeding or feeding processes. The prey of 17 pairs collected consists entirely of Diptera, as follows: 14 *Bibio pallipes* Say., a very abundant species at the time, and one each of *Pegomyia fusciceps* Zetterstedt., *Borborus equinus* Fallen and an *Empis* sp. in too poor condition for identification. In this connection the writer wishes to express his hearty thanks to Mr. D. W. Coquillett for determining the flies herein mentioned.

Although numbers of *Empis spectabilis* were seen every day for a week no indications were noticed of balloon or other web making such as has been described in the case of *E. aerobatica* and several European Empididae. The observations are in harmony with previous ones demonstrating the predaceous qualities of Empids; they show furthermore that cannibalism, at least of a generic character, is practiced. Great dexterity in suspending themselves and in manipulating their prey, characterizes the Empids so far observed. Behavior in sexual union varies greatly; an interesting feature is the carrying of prey at this time by two of the four species whose habits are known.

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OF INTEREST TO COLLECTORS OF INSECTS.—PROGRESS IN CUBA.—With the beginning of the present fiscal year the Republic of Cuba establishes a Bureau of Information, President Gomez appointing Leon J. Canova, an American newspaper man, who has resided in Cuba eleven years and has a wide acquaintance with the Island, as its director.

Parties wishing information of any nature concerning Cuba can obtain same, free of charge, by writing to Leon J. Canova, U. and I. Bureau (Utility and Information Bureau), Department of Agriculture, Commerce and Labor, Havana, Cuba.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., OCTOBER, 1909.

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At its last meeting the Entomological Society of America passed a resolution to the effect that it saw no wisdom in a duty on insects. The reasons for this were set forth in a carefully prepared and to our mind convincing document which was signed by the proper officers of the society and sent to the Chairman of the Ways and Means Committee in Washington, D. C.

The merits of a case do not appear to cut much figure in Congress and the expected happened.

The act now in force which appears to cover insects is as follows: "Specimens of natural history, botany, and mineralogy, when imported for scientific public collections, and not for sale," are on the free list. The act is ambiguous in some respects as stuffed birds; eggs of birds, fish and insects; fossils; minerals and shells are free. Entomologists as yet can have no "political pull" and we hope they never will have. Tariff bills are apparently not framed on the merits of any particular case.

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A. W. MORRILL has resigned his position with the Bureau of Entomology as investigator in charge of Citrus White Fly Investigators and has accepted the position of Entomologist of the Arizona Horticultural Commission and of the Arizona Experiment Station.

AS WILL be noticed among the advertisements in this number a new price list of publications for sale, has been issued by the American Entomological Society; and also a "Classification of the Families of the Coleoptera of America north of Mexico," giving tables or keys by which the families may be distinguished, a very useful pamphlet to those interested in that order of insects.

## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DOCTOR PHILIP P. CALVERT writes as follows from Costa Rica :—By such papers as have reached us, I see that you have had a much hotter summer in Philadelphia than we have had here in Cartago. For July and August we are keeping a record of temperatures given by our self-recording maximum and minimum thermometer, and the maximum has never yet reached 80 in the shade. In the low country of course it is hotter.

Mr. William Schaus has been of great assistance to me in giving information about favorable collecting places, etc. He expects to go to Washington in September next and to London about Christmas, to work up his book on Costa Rican Lepidoptera, based on his collections of the last three years. It will be a very extensive list—much exceeding the Biologia. He has done so much that it seems hardly worth while for anyone else to touch Lepidoptera here.

Since writing you in May, I have made trips to Guapiles, Guacino, Juan Vinas, Turrialba, Tierra Blanca, Volcano of Irazu and El Alto, representing elevations from 350 to 11,000 feet above sea level. So far I have not been able to find Odonata above 6400 feet, though you took them at 11,000 feet in Colorado, and Van Ostrand and I at 8600 and 9000 feet in Mexico. Some days we spend almost exclusively in looking for Odonate larvae and have succeeded in finding those of some genera whose larvae were previously unknown. In many groups of plants and of animals we see interesting things and of some of them we have photographs from life. Altogether we are enjoying our study of Costa Rica very much.

*Osmia mandibularis* Cresson.—In my list of the bees of New Mexico (Trans. Am. Ent. Soc., 1906, p. 305), I cited a species of *Osmia* from Rociada, which I had formerly recorded as *O. mandibularis*, but which Mr. Titus, having seen Cresson's type, held to be distinct and undescribed. Today, at Boulder, Colorado, I dug out from a bank a cluster of old *Osmia* nests, containing some dead specimens of the bees. The first one I examined proved, to my delight, to be a genuine female *O. mandibularis*, with enormous basal processes on the mandibles. The Rociada insect, compared with this, has the processes very greatly reduced, but is in other respects the same. As Mr. Titus suggested, it looks like a distinct species; but I find among my Boulder specimens one which is of much smaller size than the type with the mandibular processes greatly reduced. As this small specimen is in other respects a *mandibularis*, and as it came from the same group of nests, it is evident that *O. mandibularis* is a very variable species, and that the Rociada specimens belong to it after all.

The smaller female, however, agrees with Cresson's description of *Osmia faceta*, except for the more distinct nodosity on the mandibles. It is evident that *faceta* is very closely allied, if not one extreme of the variation of *mandibularis*.

In the same group of nests, I found a very much broken male. This agrees with Cresson's short description of male *faceta*. Its distinctive characters are as follows:—*O. mandibularis* ♂. Smaller than the normal ♀, but of the same blue color. Head large; hair of face (where very abundant), vertex and cheeks, as well as that on thorax, entirely white; ocelli rather large, in a low triangle, the distance between hind ocelli less than distance from one to eye-margin, lower edge of clypeus black, somewhat upturned, broadly truncate in the middle, with a very faint appearance of crenulation; antennæ black, ordinary; tegulæ shining black; legs black with light hair; fourth and fifth segments of abdomen fringed with white hair (segments 1 to 3 missing); sixth clothed with glittering white hair, and with a rather small apical notch; seventh bidentate. *O. chalybea* Sm. is allied.—T. D. A. COCKERELL, Boulder, Colorado.

GUNNING FOR BUGS.—Tuesday night Ralph C. Wright and a companion were out two and a half miles west of town hunting. Shortly after six o'clock they heard a buzzing and humming noise which they could not account for, until looking up they saw the sky fairly black with large beetles flying from the west toward the east. There appeared to be thousands of them and being curious to know what they were they took a few shots at them. A number were brought down and one was brought to this office by Mr. Wright. It proved to be the common black boat shaped water scavenger beetle known to scientists as *Tropisternus triangularis*. It is one of the largest beetles, being one and a half inches in length. They were undoubtedly flying from the waters of the Basin west of this city to some other body of water east of the city.—WARREN KNAUS, McPherson, Kansas.

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## Doings of Societies.

The fifty-second meeting of the Hawaiian Entomological Society was held in the Library of the Hawaiian Sugar Planters' Experiment Station, Honolulu, June 3, 1909.

Mr. Kirkaldy read the following papers: "Notes on the genus *Oechalia* (Hem.);" "A note on the synonymy of a Hawaiian beetle."

President Swezey exhibited specimens and read a paper on *Hypocala velans* (Lep). He also read a paper by Mr. Giffard entitled, "Note on *Plagithmysus perkinsi*" Sharp. (Col.)

The fifty-third meeting of the Hawaiian Entomological Society was held in the library of the Hawaiian Sugar Planters' Experiment Station, July 1, 1909.

Mr. Swezey exhibited specimens of a lepidopterous leaf miner, *Gracilaria mabaella* n. sp., in Hawaiian Ebony (*Maba sandwichensis*), and red notes on its life history.

Mr. Terry read a paper entitled "Notes on Some Common Introduced Insects in Hawaii also Observed in South China;" Lepidoptera 1, Coleoptera 2, Hymenoptera 2, Orthoptera 2, Diptera 6. Total 13 spp.

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The fifty-fourth regular meeting of the Hawaiian Entomological Society was held in the library of the Hawaiian Sugar Planters' Experiment Station, August 5, 1909.

Mr. Kuhns read a few notes on a number of well-known insects observed on a recent trip to Maui, having unusual habits.

Mr. Kotinsky gave interesting notes on *Aspidiotus destructor*.

Mr. Swezey exhibited a jar of corn from Kula, Maui, attacked by the sugar cane borer *Sphenophorus obscurus* (Col.)

Mr. Swezey gave the following corrections in name of a Tortricid whose habits were given by him in a previous paper under the name *Enarmonia*. He had recently determined it to be *Adenoneura falsifalcellum* Wlsm. He also gave some notes on *Dromacolus bonvouloiri* Shp., a *Eucnemid* with very peculiar larvae living in rotten wood.

DANIEL B. KUHNS, *Secretary*.

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A meeting of the Newark Entomological Society was held on March 14, 1909, at Turn Hall. The President was in the chair and nineteen members present.

Messrs. F. B. Monaghan, of Newark, and Henry Hofer, of Paterson, were elected members.

Mr. Buchholz reported the capture of *Xylina grotei* at Elizabeth, February 22d.

Prof. Wormsbacher remarked that *Phyciodes mycteis* was locally common in 1908.

Mr. Brehme presented a paper entitled "Notes on Some New Jersey Lepidoptera" in which he reviewed the Rhopalocera



and larger Heterocera, comparing the present rarity of some of the species around Newark with their comparative abundance in past years. This he attributed in a measure to the encroachments of the expanding city upon the breeding grounds, but also to parasitism and disease to which many species seemed especially subject in late years. In closing his paper, Mr. Brehme called attention to the advisability of transferring the better species to new fields.

In reference to this latter statement Professor Smith said that considerable work of this character is being done in England with good results.

Mr. Doll spoke of the difficulties sometimes attendant upon the transference of insects from one place to another and said that all his attempts to establish *Philosamia cynthia* in new localities were absolute failures, due probably to the larvae falling prey to birds. He also spoke of the terrific destruction caused to insect life by the burning of the fields and woodlands. Limacodids are being literally banished from large sections of territory lying adjacent to cities, and such species as *Ecpantheria deflorata*, once so common, are now being reduced almost to extinction by this same cause.

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A meeting of the Newark Entomological Society was held April 11, 1909, in Turn Hall with the President in the chair and twenty-three members present.

Mr. John Kuenzler, of Paterson, was elected to membership.

Mr. Buchholz stated that *Philosamia cynthia* cocoons were this year generally parasitized by a species of *Pimpla*.

Prof. Wormsbacher reported *Feralia jocosa* unusually abundant at Alpine, N. J.

Succeeding these reports Professor Smith gave a lecture on Mosquitoes, illustrated with lantern slides. He outlined the work that is being done in New Jersey and gave a history of the development of the methods now in use in ditching marshlands. The work of extermination in New Jersey is progressing as rapidly as the limited funds appropriated by the Legislature will permit. Already 25,192 acres of salt marsh have

been drained and 3,633,974 feet of ditches, 10 inches wide by 30 deep, have been cut. Practically no mosquitoes have developed on this vast area since the work has been done and the eggs with which the marsh is littered are constantly growing less so that with each water covering fewer larvae hatch.

JOHN A. GROSSBECK, *Secretary*.

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### First International Entomological Congress.

BRUSSELS, BELGIUM, AUGUST FIRST TO SIXTH, 1910.

In the middle of August of next year the Eighth International Zoological Congress takes place in Graz, Austria. Such meetings further science not only by the communications and the discussions connected therewith but especially through the opportunity offered to zoologists to come in personal contact with one another.

It is evident that entomology plays a very subordinate role at these Zoological Congresses. The number of entomologists who take part in these assemblies and the time which can be spent on this branch of zoology is small in proportion to the multitude of persons engaged in entomological research, and the great advance which this science has made. The importance of entomology in agriculturè and medical matters becomes more and more recognized and we therefore think the time appropriate to unite in one distinctive congress all the entomologists with their different branches and to create an International Standing Committee as a central organization to forward entomological interests.

One of the chief objects of this undertaking is to bring entomologists in closer relations with general zoology on the one side, and with the practical side of entomology on the other.

With this in view we propose that an Entomological Congress be called every three years, about two weeks before the Zoological Congress, so that propositions and conclusions of general importance can be brought forward for discussion. The First International Entomological Congress will hold meetings in Brussels from the first until the sixth of August, 1910, at

which time and place occurs the World's Exposition. The program will be issued during the winter of 1909-10; it seems to us desirable to place at the present time the following propositions before entomologists.

The subjects on which all entomologists are invited to contribute are: Systematics, Nomenclature, Anatomy, Physiology, Palaeontology, Psychology, Ontogeny, Phylogeny, Ecology, Mimicry, Ethology, Bionomics, Zoogeography, Medical and Economic Entomology and Museology.

Committees in Brussels will look after the accommodation and entertainment of members and will be present to offer advice.

The members of the Congress will be:

1. Life members, who pay a sum of at least \$50 to cover the contributions for all future Entomological Congresses. Their contributions will go into a permanent fund of which only the interest is to be used at the discretion of the International Standing Committee. They will receive all the publications of the Congress.

2. Ordinary members, who pay a contribution of \$5 for each Congress and who receive all publications gratis. Ladies and children accompanying members pay \$2.50 for each Congress and receive all favors of the members, but receive no publications.

Local committees have been formed in various countries to aid the Executive Committee in the important preliminary work for the First Entomological Congress.

Those whose names we give herewith will give further information on inquiry. In the name of the Provisional Standing Committee:

E. L. Bouvier, H. Rowland Brown, G. C. Champion, F. A. Dixey, L. Gangblauer, W. Horn, A. Janet, K. Jordan, A. Lameere, G. B. Longstaff, E. B. Poulton, G. Severin. Executive Committee: W. Horn, A. Janet, K. Jordan, G. Severin. Chairman of the Committee for the United States: Henry Skinner, Philadelphia. Chairman of the Committee for Canada: C. J. S. Bethune, Guelph.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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### Some new Wasps.

By S. A. ROHWER, Boulder, Colo.

#### ***Lyroda cockerelli* n. sp.**

*Male*.—Length 8 mm. Clypeus rounded on the anterior margin; without teeth, slightly notched in the middle. Front finely closely punctured, appearing finely granular; the vertex with larger sparser punctures; no depressed line from the anterior ocellus; the third antennal joint distinctly longer than the fourth; dorsulum with rather close medium size punctures; scutellum and postscutellum shining impunctate; mesopleurae shining, almost impunctate; metanotum with a distinct longitudinal carina for the basal two-thirds; transversely crossed by many irregular striae; the lower part of the metapleurae impunctate, the upper part like the metanotum; the upper part of the posterior face with a distinct diamond-shaped area, bounded by strong ridges and longitudinally crossed by a furrow; the lower part of the posterior face with a strong longitudinal carina; femora rather robust; the third cubital cell wider on the radius than the second; the basal abdominal segments shining, the apical subopaque, closely, finely punctured. Entirely black; the clypeus and face with thick golden pubescence; the apical margins of the abdominal segments one to three with bright silvery pubescence; the two apical segments with fuscous pubescence. Wings hyaline, the apical margin strongly dusky; costa and stigma black, the other nervures pale brown.

Type Locality: Campus of the University of Colorado, Boulder, July 7, 1908. One female collected by T. D. A. Cockerell.

A very distinct species not closely related to any described

American one. The golden pubescence of the clypeus is a good superficial character by which it may be distinguished from other members of the genus.

***Notogonia subaequalis* n. sp.**

*Female*.—Length 16 mm. Anterior margin of the clypeus rounded out, with a distinct semicircular notch in the middle; anterior part shining, impunctate, the upper part with close rather large punctures; there is no basal carina; palpi hairy, the apical joint of the maxillary longer than the preceding one and slender, slightly reddish. Antennae as long as the head and thorax, not longer as in *N. aequalis*; scape with a fairly distinct longitudinal carina beneath; the third, fourth and fifth antennal joints about equal; the fourth and fifth joints slightly constricted basally. The space between the eyes at the vertex about the same as the length of the third antennal joint. Head normal, the impression in front of the ocelli is very deep while the one behind them is not very deep; head very finely closely punctured, appearing dull. Dorsulum with distinct close, small punctures; there are no impressed lines on the dorsulum; the scutellum punctured like the dorsulum, not impressed; metanotum granular with a shallow longitudinal impressed line anteriorly; spiracles long linear not open; the posterior face separated from the metanotum by a transverse carina; the upper part of the posterior face is wrinkled, the rest is granular; a distinct longitudinal furrow on the posterior face; legs strongly spinose; the radial cell truncate; the third cubital cell broader on the radius than the second; the recurrent nervures almost meeting. Abdomen a little shorter than the thorax; dull above, shining beneath; the anterior segments very closely finely punctured, the two apical segments with large separate punctures; pygidium broad, the apex emarginate, the angles sharp and broad; sheath obtusely rounded at the apex, about twice as long as broad; pygidium covered with brown or black hairs or bristles. Entirely black; the upper part of the dorsulum with long glittering, scattered hairs; the two basal dorsal segments with silvery pile. Wings dark, not strongly iridescent, and in certain lights subhyaline; venation dark, weakening toward the apex; the posterior wings are not as dark as the anterior.

Type Locality: Fedor, Texas. One specimen, the type which is in the collection of G. Birkmann, was collected September 11, 1897, by G. Birkmann.

This species is close to *aequalis* Fox, but the flagellum is shorter, the metanotum is without a median carina, and the wings are strongly iridescent. The length of the antennae is about the same as *N. nigripennis occidentalis* Vier., but the

third and fourth antennal joints are equal, and the dorsulum is without longitudinal impressed lines. The darker wings and the shape of the pygidium separate it from *N. argentata* (Bve.) which is found in the same locality. Of all the species described by Cameron (Biol. Centr. Am.) it is closest to *montezuma* (Northern Sonora, Mex.).

***Astata asperiformis* n. sp.**

*Male*.—Length 7 mm. Middle lobe of the clypeus produced into a narrow sharp tooth. Front below the white mark punctato-reticulate; the white band and the intercellar area shining, with a few scattered punctures; the area above the ocelli more closely sculptured; cheeks shining with a few irregular sculptured patches. The third and fourth antennal joints a little enlarged at the apex; the third joint somewhat longer than the fourth. Anteriorly the dorsulum is closely punctured, posteriorly more sparsely so and it is shining; scutellum punctured at the sides, the middle shining and almost impunctate, slightly impressed; mesopleurae granular. Metanotum finely reticulate, at some angles appearing obliquely striated at the base; at the apical middle there is a rather large, distinct triangular depression; metapleurae finely striato-granular. Legs normal, spines and spurs black. Radial cell shorter than the first cubital; the first cubital cell without a spurious nervure. Abdomen shining. Color black; the abdomen bright red; a band beneath the eyes, tegulae, and two spots the wings *cream-colored*; wings hyaline the apical third dusky, venation brown. The head and thorax with pale pubescence.

Type Locality: Boulder, Colo. Three males collected Aug. 5, 1908 and July 20, 1908 (S. A. Rohwer); one male Ft. Collins, Colo., No. 1203 of the Agriculture College. The eyes in life are pea green.

This species seems to be closest to *aspera* Fox, but it is larger than that species, and there are two white spots below the tegulae. In some respects it is like *elegans* Cresson, but the apical third of the wings are dark, and there is no white on the legs and the abdomen. It cannot well be the male of *montana* Cresson, because the pubescence is white, not black, and the scutellum is impressed.

***Gorytes cockerelli* n. sp.**

*Male*.—Length 8 mm. Head rounded above; inner eye margins parallel; ocelli in a low triangle, the distance from one of the lateral ocelli to the nearest eye margin about the same as the distance from

one of the lateral ocelli to the anterior ocellus. Clypeus very slightly notched in the middle; the apical joint of the maxillary palpi distinctly shorter than the preceding one. Front and the vertex very closely granular, opaque; the cheeks shining very finely punctured. Antennae rather sparsely clothed with white hairs; the third joint a little longer than the fourth; the apical joints normal, the apical one about the same length as the preceding one. Pronotum slightly notched in the middle; dorsulum closely, finely punctured; the suture between the dorsulum and the scutellum strongly striolated; the scutellum more finely and sparsely punctured than the dorsulum, and separated from the postscutellum by a striolated furrow; mesothorax shining, with some fine punctures and some larger punctures intermixed. Enclosure of the metanotum distinctly defined, channeled by a longitudinal furrow, and the basal half with strong longitudinal striae; the posterior face with some large punctures; the metapleurae shining. Legs very weakly spined. The transverse cubitus of the hind wings interstitial with the transverse median. The first abdominal segment much smaller than the second, coarctate at the apex; the second segment subglobose, shining, with a few scattered punctures. The apex of the abdomen with two spines (it may be that there are normally three and that one of them is broken off); ventral plate not bifid. Color black; labrum, clypeus except two basal spots, face below the antennae, inner orbits almost to top of the eyes, spot below the eyes, base of the mandibles, scape beneath, line on the pronotum, tubercles, spot below the tegulae, line on the scutellum, an indication of a line on the postscutellum, a band on the first four abdominal segments (on the second it is interrupted into two elongate spots), bands on the second and third ventral segments (slightly interrupted medially), and lateral spots on the fourth ventral segment, *lemon-yellow*. Legs mostly yellow; four anterior coxae, trochanters and femora above black; posterior coxae mostly black; the posterior legs and a few spots on the intermediate pair ferruginous. Flagellum with a fulvous tinge beneath. Wings hyaline, radial and subradial area slightly clouded; venation brown, most of the stigma luteous. Sides of the thorax and the front with short white hair.

Type Locality: Campus of the University of Colorado, Boulder. Named for Prof. T. D. A. Cockerell who collected the single specimen July 27, 1908.

This is a very distinct species. In the shape of the first abdominal segment it is related to *bipunctatus* Say, but it is widely different from that species in the more abundant yellow markings. It does not exactly fit any of the genera defined by Dr. Ashmead, but is perhaps closest to *Hoplisus*.

## Notes on the American Oribatid Fauna, with a List of Four Species of European Oribatidae Hitherto Unknown in This Country.

By H. E. EWING, Urbana, Ill.

The oribatid fauna of North America in general appears to be distinct from that of Europe. Mr. Banks in his catalogue of the Acarina of the United States (Proc. U. S. Nat. Mus. Vol. XXXII, pp. 595-625) gives a list of eighty-four species known in this country and according to this author they are all peculiar to America. In the course of about three years collecting, being assisted by several other persons, I have found four species in this country which I give here below that are well known European forms, one of which is remarkable in being saltatorial.

**Notaspis bipilis** Herm., Mém. apt., p. 95.

In moss. Collected by L. M. Smith at Parker, Ill., and by the writer at Arcola, Ill. Several specimens.

**Zetorchestes micronychus** (Berl. and Can.), Berl. Acar. Myr. Scor. fasc. 4.

In trash. Collected by means of a Berlese funnel by C. R. Crosby at Columbia, Mo.

**Hermannia bistriata** (Nic.) Arch. Mus. Paris, Vol. vii, p. 397.

Under logs, in moss and in trash. Collected by C. R. Crosby at Columbia, Mo., by J. Douglass Hood at Urbana, Ill., and by the writer at Arcola, Ill.

**Tegeocranus velatus** Michael, Jour. Royal Mic. Soc., Vol. iii, p. 189.

In moss. Collected by the writer at Muncie, Ill.

The first of these species, *Notaspis bipilis* Herm., is closely related to *Oppia spinipes* Banks and *Oppia montana* Banks, but the author has compared the specimens with a named specimen sent him by Mr. A. D. Michael and finds that they agree in every respect with *N. bipilis* Herm. This species has a wide distribution having been found before now in many places in Europe, in Siberia and in the arctics. Its habitat is exclusively in moss.



The second species, *Zetorchestes micronychus* (Berl. & Can.) is very remarkable in that the last pair of legs are enlarged and fitted for jumping. This is the only known oribatid which has that power, which is made possible by the peculiar structure of the fourth pair of legs and the large and powerful abdominal muscles. Already this species has been recorded from Italy, Switzerland and Algeria; the authors' record making it known to three continents. I have but a single specimen of this species sent me by Mr. Crosby but it is well preserved and agrees excellently with Canestrini's and with Michael's figures, and since so many parts of its structure are so characteristic I feel confident of the determination.

The third species, *Hermannia bistriata* (Nic.) appears to be quite common in central Illinois and at Columbia, Mo., as I have dozens of specimens from both these places. This species has a general distribution in Europe. According to Michael the imago is terrestrial, on moss, while the nymph is amphibious on land moss or Sphagnum. I have found the adults quite common under old logs, as well as in moss.

The fourth species, *Tegeocrannus velatus* Michael, has only been found in England before now, where it lives in moss. This is the situation in which the author has found it.

Mr. A. D. Michael in 1898 (*Das Tierreich*, Lief. 3., Oribatidae), reviews the Oribatidae, giving a list of 198 known, good species. Since that time fully one-half as many more have been added making the total number of known Oribatidae now near 300 species. Of the 198 species described by Mr. Michael, 160 are known in Europe where the Oribatidae, as well as the other Acarina, have been much better worked up than in the rest of the world. Up to the present time the writer has in his collection 93 species of Oribatidae, the most of which have been collected in Illinois, Indiana and Missouri. Judging from the great number of species met with in this area I would infer that the total number of North American species must be at least somewhere in the neighborhood of 300.

It is a remarkable fact that while over 90 per cent. of the species found in this country are new, yet only two genera are peculiar to this country. The American fauna differs from that of the old world also in the much greater percentage of smooth species. In this country at least 70 per cent. of the species have a smooth, shiny integument, while in the old world the numbers of smooth and of rough or sculptured species are almost equal. The causes for this difference are not known. Here are some suggestions which may possibly account for such an apparent difference in the faunae of the two continents.

1.—That the shiny species are much more easily seen because of their reflection of light from the surface of the integument, and that a more complete search in this country will reveal many more rough species here.

2.—That there is something peculiar or favorable in our climate or in the vegetation upon which the mites feed that causes a larger percentage of smooth species.

3.—That most of the shiny species were originally indigenous to this country and that most of the species that there are in Europe of this kind have been largely introduced from America, where the shiny species, or some of the most important genera including these species, have had a long continued history and consequently a greater chance for the production of new species.

In regard to the first factor there is but little doubt but that it plays an important part in the apparent difference of our fauna from that of Europe. I have found that in the case of my collection that it was over a year before I discovered a single rough species. Since that time a careful watch and search has revealed nearly two dozen of these.

In regard to the second cause, little is known as present due to our unfamiliarity with their food habits.

The third mentioned cause has some evidence in its support for it is true that the increased percentage of smooth species in this country is largely due to the large number of the abdominal-winged forms here, which already number over 40 species.

It may be added in closing that the rough species, as those of the genera *Nothrus*, *Neoliodes*, etc., are very sluggish in their movements and for this reason are not noticed as quickly as the more active, shiny ones. Further records will doubtless soon settle some of these interesting questions.

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### Ticks on the California Ground Squirrel.

By WM. B. WHERRY AND F. CREIGHTON WELLMAN,

Cincinnati, Ohio, and Oakland, Cal.

The important role played by a California ground squirrel (*Otospermophilus beecheyi*) in the epidemiology of plague in the United States makes a study of its parasites of particular interest. During June, July and August we found these rodents to be heavily infested with ticks which occurred in greatest numbers about the neck and ears. Specimens were sent to Mr. Nathan Banks who has kindly given us the following preliminary report: "There were two species of ticks; one specimen is a common species in California known from many hosts—*Dermacentor occidentalis* Neum.; the other specimens represent a new species of *Ixodes*, which I shall describe as *Ixodes æqualis*. It is related to the *I. augustus* of Washington and Alaska, but has a larger and shorter shield, and minor differences."

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THE ENTOMOLOGICAL SOCIETY OF AMERICA will meet in Boston on Thursday and Friday, December 30th and 31st. The members and visiting entomologists will be the guests of the Cambridge Entomological Club at a smoker. There will also be a special exhibit covering all branches of entomology. More particulars of the meeting will be given later. All entomologists should make it a point to attend.

THE twenty-second annual meeting of the American Association of Economic Entomologists will be held in Boston, on Tuesday and Wednesday, December 28th and 29th. This promises to be a very large meeting. The president this year is Dr. W. E. Britton, of Connecticut, who will preside.

## Notes and Descriptions of Some Trypoxline Wasps.

By S. A. ROHWER, Boulder, Colo.

## GROUP FRIGIDUM.

The group of Trypoxline wasps of which *frigidum* F. Sm. may be taken as the type consists of small (about 8 to 11 mm.), slender, black, little pubescent species. There is no enclosed area on the metanotum, but in some species there is a strong central furrow; the hind trochanters of the males are simple. The following table will separate the species which are known to belong to this group:

Females . . . . .	1.
Males . . . . .	4.
1. Metanotum without a median furrow (clypeus with a narrow tooth which is sometimes bidentate) . . . . .	<b>frigidum</b> F. Sm.
Metanotum with a strong median furrow . . . . .	2.
2. Clypeus regularly rounded on the anterior margin . . .	<b>regulare</b> Vier.
Clypeus with a broad slightly emarginate tooth . . . . .	<b>apicale</b> Fox.
Clypeus with a narrow tooth . . . . .	3.
3. Striae of the metanotum almost transverse; first abdominal segment but little longer than the second, and with a much shorter petiole; dorsulum with distinct punctures; shining.	
	<b>nigrellum</b> Roh.
Striae of the metanotum mostly longitudinal; the first abdominal segment about twice as long as the second, and with a long petiole, nodose at the apex; dorsulum opaque, very closely and finely punctured . . . . .	<b>bidentatum</b> Fox.
4. Metanotum with a distinct middle furrow (the clypeus with a narrow bidentate projection) . . . . .	<b>bidentatum</b> Fox.
Metanotum without a distinct median furrow . . . . .	5.
5. Dorsulum shining, with scattered punctures; no furrow from the anterior ocellus . . . . .	<b>subfrigidum</b> Roh.
Dorsulum opaque, with very fine close punctures; a distinct furrow from the anterior ocellus . . . . .	<b>frigidum</b> F. Sm.

**Trypoxylon frigidum** F. Smith.

I have collected this species from the following localities in Colorado: Florissant, June 11 to July 24, most of the specimens were collected on the foliage of *Ribes vallicola*; one female Boulder, September 24, 1906; one female Troublesome, June 8, 1908, altitude 7345 feet.

Fox (Tr. Am. Ent. Soc. XVIII, p. 143, June, 1891) gives the

distribution of this species as follows: "Hudson's Bay (Smith) to Virginia, westward to Mt. Hood, Oregon." From the above distribution this species may be said to belong to the Boreal and Transition Life zones. H. S. Smith records this species from Glen, Sioux Co., Nebraska, which is in the Upper Sonoran Life zone.

The clypeus sometimes has the tooth bidentate, in the females however it is usually entire. The sculpture of all the specimens before me is the same. The first abdominal segment is not twice as long as the second, and is not strongly nodose at the apex.

***Trypoxylon subfrigidum* n. sp.**

*Male*—Length. 5 mm.; very slender. Anterior margin of the clypeus with a narrow bidentate tooth, the lobes of which are acute. The space between the eyes at the top about twice as great as the space between them at the clypeus. Front very finely granular; the vertex with fine close punctures; there is no impressed line from the anterior ocellus, but the anterior ocellus is in an indistinct pit. Apical antennal joint tapering, slightly curved, as long as the three preceding joints combined; third antennal joint about the same length as the fourth, perhaps a little longer. Dorsulum with distinct scattered punctures. Pleuræ similarly punctured, the suture straight and deep. Scutellum sculptured like the dorsulum, not impressed. Metanotum rugose to striato-granular, the striæ mostly longitudinal, but slightly oblique; there is no impressed median furrow. Metapleuræ shining, finely striated; posterior face granular, with a deep furrow. Legs without spines. The first abdominal segment but very little longer than the second, and but slightly nodose at the apex. Color, black; palpi, pale; tegulæ and fore tarsi brownish; spurs pallid. Wings hyaline, the apical margin dusky, iridescent; venation black.

Type locality: Fedor, Texas. Described from one male collected by G. Birkmann, May 1, 1904.

This species is closest to *frigidum*. Besides the character given in the foregoing table it may be separated from *frigidum* by the longer second abdominal segment, and the brownish tegulæ.

***Trypoxylon bidentatum* Fox.**

I have seen a female of this species from Boulder, Colo., September 14, 1906 (S. A. Rohwer). Fox (loc. cit. p. 143)

says this species occurs with the preceding (*frigidum*). In all the collecting at Florissant no *bidentatum* has been found while *frigidum* is very common.

**Trypoxylon nigrellum** n. sp.

*Female*—Length 7 mm.; slender. Anterior margin of the clypeus produced into a narrow bidentate tooth, the lobes of which are short and obtuse. Space between the eyes at the vertex not twice as great as the space between them at the clypeus. Front rather coarsely granular; the vertex with small close punctures. Third antennal joint a little shorter than the fourth; the antennæ slightly thickened toward the apex; the apical joint somewhat longer than the preceding. Dorsulum and the scutellum shining, with distinct, scattered punctures; the scutellum not impressed; the punctures on the pleuræ more separated than on the dorsulum, the suture deep and strong. Metanotum with transverse striæ (some of the striæ are oblique), there is a strong medial furrow; metapleuræ rather strongly obliquely striated; the posterior face granular or slightly striato-granular, with a deep median furrow. The furrows of the metanotum and the posterior face are not connected. The posterior tibiæ with a few feeble spines. The first abdominal segment but little longer than the second, and not strongly nodose at the apex; the second segment a little more than twice as long as the width at the apex. Black; palpi pale brown; tips of the mandibles and the tegulæ testaceous; spurs pallid. Wings hyaline, the apex not distinctly dusky, iridescent; the venation black.

Type locality: Lee County, Texas. Two females collected by G. Birkmann May 3, 1906, and April, 1907. The specimen collected April, 1907, was chosen as the type.

Besides the characters mentioned in the foregoing table this species differs from *bidentatum* Fox, its nearest ally, in the distinctly striated metapleuræ (the metapleuræ of *bidentatum* are shining and not distinctly sculptured).

**Trypoxylon apicale** Fox (Tr. Am. Ent. Soc., xviii, p. 143, 1891).

"Occurs in Canada and at Beverly, Mass."

**Trypoxylon regulare** Vier. (Tr. Am. Ent. Soc., xxxii, p. 205, July, 1906).

Douglas County, Kansas, altitude 900 feet.

GROUP EXCAVATUM.

Large, shining black species, as a rule not densely pilosed; the hind tarsi white; the wings fuscus or hyaline; no enclosed area on the metanotum, which is punctured or transversely

striated; the hind trochanters of the male are simple. This group may be separated from group *albitarse*\* by the paler wings, the pale pubescence, the absence of a hoop on the second ventral segment of the male, and the different clypeus of the female. The following table will separate the species of this group as far as they are known:

Head and thorax with dense silvery pile (scutellum impressed medially; the apex of the metanotum transversely striated; prothorax bispinose beneath). Cuba, Jamaica, Ill., N. Y.

**excavatum** F. Sm.

Head and thorax without dense pile, but with long hair . . . . . I.

1. Metanotum, except the base, transversely striated; a patch of silvery pile below the tegulae. Mexico and Guatemala.

**cinereum** Cam.

Metanotum punctured, the apex sometimes with transverse striae; no silvery pile below the tegulae . . . . . 2.

2. A narrow transverse sulcus on the pronotum.

**albopilosum albopilosum** (Fox).

A broad, deep shining sulcus on the pronotum.

**albopilosum planoense** Roh.

**Trypoxylon albopilosum albopilosum** (Fox).

The scutellum of this species is not always impressed nor is there always an impressed line on the front. Specimens from Lee County, Texas, have the wings somewhat darker than specimens from Virginia. The distance between the eyes at the clypeus is sometimes slightly less than the distance between them at the vertex. This species seems to belong to the Carolinian and Austroriparian faunal areas.

**Trypoxylon albopilosum planoense** n. subsp.

*Female*.—Length 18 mm. This form may be separated from *albopilosum* proper by having the clypeus similar to it but the emargination much shallower; the ocellar area is more closely punctured; the suture on the pronotum is broad, deep and shining; the scutellums are not impressed; the apical middle of the metanotum is not impressed nor striated, but punctured like the rest of the metanotum.

Type locality: Plano, Texas. Described from one female collected by E. S. Tucker June, 1907. The type is in the U. S. National Museum.

\*It seems quite probable that *neglectum* Kohl is the male of *albitarse*.

Mr. E. S. Tucker sent this form to me asking if I thought it was a new species. After comparing it carefully with *albopilosum* I think it is only a sub-species separated by the above characters. Prof. T. D. A. Cockerell found the bee-fauna of Plano included both humid and arid region species, (Can. Ent. p. 129, April, 1909). May not *planocense* be the arid region form of *albopilosum*?

***Trypoxylon spinosum* Cameron.**

I have seen two males and two females of this species from Lee County, Texas, which were collected by G. Birkmann. The sides of the first abdominal segment in the male are reddish, the anterior tarsi are also reddish, and the pubescence is slightly golden.

The female is much like the male. It is close to *rufozonale* Fox, but differs in having the eyes farther apart at the vertex than at the clypeus, the pubescence has a golden tinge, and the tarsi and bases of the posterior tibiae are fulvous.

***Trypoxylon aureolum* n. sp.**

*Female*.—Length about 16 mm. Anterior margin of the clypeus with a deep notch in the middle; the clypeus is as long as wide. There is a very faint carina between the antennae above; front with close punctures, the ocellar area with smaller, closer punctures and appearing granular. Behind each lateral ocellus is a transverse ridge, these ridges do not meet in the middle. The third antennal joint is about as long as joints four and five. Pronotum is rounded, without a transverse sulcus, shining, and very sparsely punctured. The dorsulum and scutellum have distinct, separated punctures, those of the scutellum are somewhat closer than those of the dorsulum; the scutellum is slightly impressed; the metapleurae are shining, and more sparsely punctured than the dorsulum. The metathorax with a faintly defined enclosed area, the apex of which is transversely striated; the posterior face with a distinct median sulcus; the entire metathorax is rather closely granular or is so closely punctured as to appear granular. The legs are without spines; the posterior trochanters have a small hump beneath. The first abdominal segment is not quite twice as long as the second and is about the shape of *rufozonale* (Tr. Am. Ent. Soc. XVIII, pl. III, fig. 13); the second segment is not raised at the apex and is not twice as long as wide at the apex. Color black; tegulae brownish; all the tibiae and tarsi, and the first two abdominal segments reddish or brownish. The usual places with dense golden



pubescence; the abdomen with golden pile. Wings slightly yellowish, the apical margin dusky; venation pale brown.

*Male*.—The male differs from the female as follows: The clypeus with a very short, broad projection which is slightly emarginate, and a short tooth in the center of the emargination; the scutellum is more strongly impressed; at the lateral, posterior margin of the metanotum is a short, longitudinal ridge; the posterior trochanters have a strong spine beneath; the two basal joints of the flagellum are fulvous, and the abdominal segments are darker.

Type locality: Lee County, Texas. Two females and two males taken by G. Birkmann. The females May, 1908, and the males August 8, 1905.

This species is close to *texense* Sauss., but the abdomen is darker, the first and second abdominal segments of the male are not the same length, and the first abdominal segment is more strongly raised at the apex. The female differs from Fox's description (Tr. Am. Ent. Soc. XVIII, p. 146, 1891) in having the antennæ black at the base, and the enclosure of the metathorax is not finely striated. Fox says the clypeus of *texense* is like *spinosum*. If this is the case the shape of the clypeus of the female will at once distinguish this species. The hump on the posterior trochanters of the female may prove a useful character.

***Trypoxylon relativum* n. sp.**

*Female*.—Length 13 mm. Anterior margin of the clypeus with three emarginations, the two lateral ones shallow and with broad, obtuse lobes, the middle one deep and with a tooth in the notch. A faint indication of a carina between the antennae above, a faint impressed line from the anterior ocellus. The distance between the eyes at the top a very little greater than the distance between them at the clypeus. The third antennal joint is not quite as long as joints four plus five; the apical joint is longer than the preceding. The thorax differs from *aureolum* in not having the scutellum impressed, and in having the sides of the metanotum wrinkled. The second abdominal segment is a little more than twice as long as wide at the apex. Color as in *aureolum*.

Type locality: Fedor, Lee County, Texas. One female collected May 12, 1905, by G. Birkmann.

This species is very close in general appearance to *aureolum*, but the clypeus is very different and the thorax offers some differences.

## Regarding Mr. Verrall's Criticism of my "Glossary of Chaetotaxy."

By W. R. WALTON, Harrisburg, Pa.

First allow me to acknowledge my great indebtedness to Mr. Verrall for his very complete criticism of my paper. It is of special value at this time in view of the fact that the paper is about to be reprinted as part of a bulletin of the Division of Economic Zoology of the State of Pennsylvania, through the kindness of Prof. H. A. Surface.

Then I wish to assure him of my hearty endorsement of one of his closing remarks, to wit: "the Glossary should be revised and considerably developed \* \* \* before it can be accepted as a standard."

I certainly never expected the work to be "accepted as a standard," but offered it simply as a help to those, who like myself, have had difficulty in grasping the chaetotactic characters unaided by sufficient illustrations.

Dean Swift's saying that "fools rush in where angels fear to tread" just about expresses my position in the matter, but if my poor paper has but the effect of stimulating some such able dipterologist as my distinguished critic seems to be, through any motive whatsoever, toward producing a more complete, accurate, better illustrated work, I shall feel that my effort has not been in vain.

I regret exceedingly that it is my misfortune never to have seen a copy of his "British Flies" and if any work of his contains terms which should have been included in my paper, I sincerely hope he will pardon the oversight as being unintentional.

As chaetotaxy reaches its highest state of usefulness as applied to the Muscoidean flies my critic is quite right in supposing that the paper seems to have been compiled for the use of Tachinologists. However, I realize now that the title of the paper is entirely too pretentious. It should have been more brief and to the point. The writer regrets exceedingly that he has no direct knowledge of the German literature re-

lating to the subject under discussion, but has been compelled by force of circumstances to make his compilations almost entirely from the works mentioned in the bibliography accompanying the paper.

As to the use of the term Calypteres, it is used throughout the works of Mr. D. W. Coquillett who evidently prefers it above all others. The following definitions are taken directly from Dr. S. W. Williston's "Manual of the North American Diptera;" Front, Peristoma or Epistoma, Propleura (Fig. 8, page 32). Pteropleural bristles, Trichostical bristles, Williston's spelling and Metapleura.

Peristoma-ium is taken from Dr. J. B. Smith's "Glossary of Entomology."

The following are defined and used in the works of Dr. Garry de Nord Hough, Gena, Genovertical plate, Transfrontal bristles, also the names for the bristles and surfaces of the legs.

It seems difficult to understand why Mr. Verrall, who appears to be a thorough student of the literature, should profess entire ignorance of Dr. Hough's papers.

The definition given for Ocellar pair is Osten Sacken's word for word. Mr. C. H. T. Townsend fathers the term Parafacial.

The writer offers no apology for having accepted as authority the works of such men as are mentioned above. Their writings will undoubtedly still be useful long after most of us have been converted to a few handfuls of dust.

*Preapical Bristles*:—My critic apparently overlooks the fact that the figure on Pl. XV shows both femoral and tibial preapical bristles.

*Wings*:—Mr. Verrall's comment under this head seems to me to have gone wide of the mark. The figure shown is plainly marked "wing of *Calliphora viridescens*." The terms given thereon may not indeed agree with those preferred by certain students of phylogeny but this does not alter the fact that they are the terms that have been generally used in descriptive writings for the past generation or longer. They are

also in use at the present time and, fortunately or otherwise, we have to "live in the present" and can but dream of the future.

In his remarks on the homologies of the veins Mr. Verrall takes me to task for neglecting the works of American students of that subject.

I cannot see that the subject comes within the scope of so limited a paper as the one under discussion. But if he insists I would respectfully call his attention to the following paragraph which occurs in Dr. S. W. Williston's "Manual of the North American Diptera" edition of 1908, page 41, to wit: "A third system is that proposed by Comstock and Needham about ten years ago, but which has found practically no acceptance among dipterologists, with the exception of one or two American writers."

The student will find abundant material for rumination in the writings of the authors above mentioned.

*Legs*:—Under this heading I am called to the bar for neglecting to define such terms as front, middle and hind legs. If one were writing of centipedes I believe there would be some justice in such a complaint, but as most insects of my acquaintance possess only three pairs of legs it seems superfluous to define them. Besides it occurs to me that the student of entomology who has not mastered these elementary terms will have no use for the paper under discussion.

Now as to the numerous misprints, flaws, misspellings, etc., which occur in my former paper:

I fear they must all be charged to me personally, though I confess some qualms at "Peteropleura."

Finally I would say that while Mr. Verrall's criticism is most welcome, I must reaffirm the hope that the "Glossary of Chaetotaxy" may still prove useful, especially to beginners and possibly even to some advanced workers in our favorite study, Dipterology.

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THE Newark Entomological Society celebrated its twenty-fifth anniversary on October 10th at Turn Hall, Newark. About fifty persons were present at the banquet and the affair was a very enjoyable one. The Society is flourishing and very active.

## Two new Philippine Culicidae.

BY FREDERICK KNAB, Washington, D. C.

### ***Mansonia chrysogona* n. sp.**

Integument ocher-yellow, the vestiture nearly throughout of golden and yellow scales.

*Female*.—Proboscis moderately long and stout, uniform, about as long as the abdomen, clothed with deep yellow scales, the tip black. Palpi about one-third the length of the proboscis, with many hairs and clothed with shining deep yellow scales, the tips black. Clypeus ochreous brown, nude. Antennae with the tori small, ochreous marked with brown; second joint yellow, the succeeding ones brownish. Occiput clothed with narrow curved golden scales and bearing many golden bristles, the vertex with deep yellow, long, erect, forked scales.

Mesonotum ocher-yellow with broad, brown, double median stripe and a brown patch over the roots of the wings; the vestiture dense, of narrow curved golden scales, with three narrow longitudinal furrows medianly; antescutellar space bare. Scutellum with scales like those of the mesonotum and with a group of golden bristles on each lobe. Pleura yellow marked with brown, with yellow setae and a few pale scales.

Abdomen cylindrical, truncate at the tip, the segments with apical rows of yellow hairs, the tip with numerous yellow bristles; the integument ocher-yellow, the vestiture above and below of broad, deep yellow, shining scales.

Wings hyaline, the scales along the veins shining ocher-yellow, narrowly lanceolate; stem of the second marginal cell about as long as the cell; base of the second posterior cell nearer the base of wing than the base of the second marginal cell; basal cross-vein more than its own length behind the anterior cross-vein. Halteres yellow.

Legs slender, clothed with yellow shining scales; hind legs with the apices of the femora and the bases and apices of the tibiae black; hind tarsi with the apical half of the second and all the succeeding joints brownish with yellow luster. Claws equal and simple.

Length: Body 4.5 mm., wing 5 mm.

*Male*.—Coloration similar to the female. Palpi long, exceeding the proboscis by nearly the length of the last joint; last two joints and apex of the long joint somewhat thickened and clothed with numerous long yellow hairs; vestiture yellow, the last two joints and the apex of the long joint dark scaled. Antennae densely plumose, the hairs brownish and golden. Abdomen depressed, broadened behind the middle; the lateral ciliation abundant, rather long, yellow. All the femora with dark apices; tarsi of all the legs brownish.

Claws: 2.0-2.0-0.0. Length: Body 4.5 mm., wing 4 mm.

Locality: Parang, Mindanao (May 31, 1906).

Type: Cat. No. 12,626 U. S. National Museum. Three specimens, 2 females, 1 male.

This species has been recorded from the Philippines by Ludlow under the name *Chrysoconopas aurites* in the belief that it is identical with *Taeniorhynchus aurites* Theobald. Theobald's species was described from Africa and specimens from that continent, undoubtedly identical, are before me. In *aurites* the vestiture of the mesonotum is coarse and suberect while in *chrysogona* it is much denser and closely appressed; *aurites* shows two longitudinal, broad, bare stripes on the dorsum of the mesonotum while in *chrysogona* there is hardly a trace of such stripes. In the African species the first three tarsals of the hind legs are white with black apical bands while the Philippine species shows no banding; the apical bands of the hind femora of *chrysogona* are absent in *aurites*. The new species appears to come nearest to Theobald's *Taeniorhynchus ochraceus* from the Malay Peninsula; *ochraceus*, however, is said to have black forked scales on the nape, while in *chrysogona* these scales are yellow.

*Taeniorhynchus aurites* and related forms have been placed by Theobald in Goeldi's genus *Chrysoconops*. This genus is founded on *Culex fulvus* Wiedemann, a species of *Aedes* (*sensu* Dyar and Knab) with toothed claws and pointed abdomen in the female. *Aurites* and *chrysogona* are undoubtedly species of *Mansonia* in spite of the striking difference in appearance. The male genitalia of *Mansonia chrysogona* correspond in every way with those of the American *Mansonia berturbans* Walker and only show slight differences, of specific value in the details. In the female the claws are simple, the abdomen blunt. The eggs are laid in a raft while in *Aedes* they are laid singly.

***Aedeomyia catasticta* n. sp.**

*Female*.—Proboscis black scaled, a white ring at the middle and a small white spot a short distance behind it; a broad white ring close to the apex. Palpi short, black scaled with white apices. Clypeus

clothed with flat white scales. Occiput clothed with roughened and erect broad scales, those in the middle and along the margin of the eyes creamy, those at the sides and on the vertex mostly black.

Mesonotum clothed with broad, ocher yellow, brown and creamy white scales; the yellow scales form a median stripe in front which broadens out at the middle; behind and at the sides the brown scales predominate; the white scales form indistinct wavy lines and there is a white patch in front of the yellow stripe. Scutellum yellow and white scaled with a tuft of black scales on each lobe. Abdomen dark scaled above, the segments with ill defined, median, apical patches of yellow scales and lateral, white, oblique marks; venter black, marked with white.

Wing vestiture black, yellow and white intermixed, the yellow scales most abundant along the costa and outwardly on the veins, the white mostly disposed in spots; there is a white spot on the costa a third from the base and continued irregularly across the wing veins, a smaller one close to the base of the wing; two-thirds from the base is the largest costal white spot, continued by white patches at the bases of the cells of the second and fourth veins and by a yellow patch upon the third vein; a small, white, costal spot towards the apex of the wing; the apices of all the veins, except the lower branch of the fifth, are white scaled and there is a white spot on the third vein in line with the outer spot of the costa.

The legs are black scaled spotted with white upon the femora, tibiae and first tarsal joints; the black scales mostly show yellow at their bases; the hind tarsi have the first and second joints white ringed at bases and apices, the last three joints white, the third and fourth with black rings close to the apices. The middle and hind femora are distinctly tufted at their apices, the front ones less markedly so. Claws simple. Length: Body 3.5 mm., wing 3 mm.

Localities: Samal, Bataan; Parang, Mindanao.

Type: Cat. No. 12,627, U. S. National Museum.

This species much resembles *Aedeomyia squamipennis* Arrib. but differs in many details and these differences appear to be constant. In *squamipennis* the proboscis has a broader white ring and the spot behind it is larger and yellow while the apical white ring is very narrow. In *squamipennis* the palpi, besides the white apex, have a large yellow patch in the middle. On the mesonotum the ocher-yellow scales are distributed nearly over the entire surface and the white spots on the wings are much smaller than in the Philippine species. The male genitalia of the two species show specific differences.

## Notes on the Eggs of *Epagoge sulphureana* Clemens.

By R. L. WEBSTER, Ames, Iowa.

In some cages in the insectary at Ames last year, some little data was obtained on the number of eggs deposited by a single female moth of *Epagoge sulphureana* Clemens. The larvae of this species were found at Charles City, Iowa, on August 5, 1908, on apple nursery stock, and a supply of them was sent to the insectary to rear. When the moths appeared, two insectary cages, large glass jars covered with gauze, were set up with a single male and female in each cage, in order to determine the number of eggs deposited by one female moth. The eggs were laid on the sides of the glass jar and the following data was secured:

Experiment A, 1 male and 1 female.

Cluster	Number of eggs	
1a	31	
1b	34	
2	40	
3	21	
4a	38	
4b	12	
5	37	
6	12	
7	19	
8	12	
Scattering eggs	5*	
	2*	
<hr/>		
Total eggs,	263	Range, 12-40
		Average, 25.6

In the case of the clusters 1a, 1b, 4a and 4b, the separate figures indicate two depositions on different nights, and these are regarded as distinct clusters. The scattering eggs, marked with a \*, are not included in computing the average number of eggs to a cluster.



Experiment B. 1 male and 1 female.

Cluster	Number of eggs
1	28
2	24
3	20
4	26
5	29
Scattering eggs	4*
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Total eggs,	141
Range, 20-29	
Average, 27.4	

In this case the male moth died a few days after being placed in the cage, and the female made her escape, so that the figures for the whole number of eggs are doubtless not so high as they might be under other circumstances.

I am indebted to Mr. August Busck for the determination of the adult moths.

### Three New Bees of the Genus *Anthophora*.

By MYRON H. SWENK, University of Nebraska, Lincoln.

#### *Anthophora nebracensis* n. sp.

♀.—Length 12 mm. Pubescence of vertex and thorax above whitish with blackish hair intermixed. Hair of cheeks and face white. Joint 3 of antennae about equal to 4-6. Mesothorax opaque, minutely reticulated. Third submarginal cell not narrowed above, wings clear, nervures brownish black, tegulae testaceous. Abdominal segments dorsally almost nude, 4 with short black hair, 2-4 with narrow but distinct white fasciae, apex of 5 with a fringe of dense black hair, ventral segments 1-5 with white apical fringes, 4 and 5 with white lateral fringes. Legs black, except the rufous terminal tarsal joints, clothed with pale pubescence except the anterior tarsi which have rusty and black hairs intermixed, the inner side of the middle metatarsi which have dusky rufous hair, and inner side of posterior metatarsi which have black hair and terminate in a large posterior apical black brush. Intermediate spurs heavy, translucent testaceous, straight, finely ciliate on inner margin.

Type: Warbonnet Canyon, Sioux Co., Nebraska, July 23, 1901, on *Monarda fistulosa* (M. A. Carriker) 1 ♀.

From *A. affabilis* this species may be known by its shorter third antennal joint and dark thoracic hair; from *A. simillima montana* by its black thoracic hair and distinct narrow white fasciae; these species flying in the same region at about the same time.

***Anthophora fumipennis* n. sp.**

♀.—Length 14 mm. Closely related to *A. abrupta* Say., but differing in having the whole of the first and medially the anterior half of the second abdominal segments with pale hair (in *abrupta* only the basal truncation of the abdomen has pale hair) and the wings very much darker, quite smoky. Thorax, abdomen as above described, and vertex with pale ochreous hair, pubescence elsewhere black.

Type: Cass County, Nebraska, 1 ♀.

This form needs no comparison with any species except *abrupta*, of which it may possibly prove to be a variety.

***Anthophora scutellaris* n. sp.**

♀.—Length 13-14 mm. A representative of the *bomboides* group, apparently closely related to *A. stanfordiana* Ckll., but differing in having the apical portion of the first and the whole of the second and third abdominal segments with their dorsum covered with pale yellowish fulvous hair (in *stanfordiana* only the second segment, except base, and the hind margin of third segment bears pale hair), the labrum with black hair, no long pale hair on the ventral surface of the fourth and fifth abdominal segments, the legs all black or blackish and covered with black hair, the wings only slightly darkened, the black hair of the scutellum and metathorax sometimes encroaching anteriorly upon the disk. Also very close to *A. neomexicana* Ckll., but easily separated by having the hair of the scutellum black and of vertex also largely black.

Type: Sioux Co., Nebraska (L. Bruner) 1 ♀.

Paratype: Warbonnet Canyon, Sioux Co., Nebraska, June 27, 1901 (J. C. Crawford) 1 ♀.

This is the form from Sioux Co., Nebraska, referred to by Professor Cockerell in his original description of *A. neomexicana*, to which species he referred it (Ann. Mag. Nat. Hist. Ser. 7, Vol. v, pp. 408-409, May 1900), but there appears to me no good reason for not considering it perfectly distinct.

## Marching Through Georgia.

BY CHARLES DURY.

Starting June 1, 1909, from Cincinnati for that Terra incognita, the mountains of N. E. Georgia, my itinerary was to go to Blue Ridge and from that point to walk across through the mountains to Clayton in Rabun County, about seventy-five miles. There to meet William Davis and Charles Leng, of N. Y., make Clayton headquarters for trips in all directions in search of desirable insects of all orders. Arriving at Blue Ridge June 2, it rained, or rather poured, for thirty-six hours without intermission. The creeks were all on the rampage. And while the swimming was fairly good, the walking was dreadful. So I rode to Blairsville, a distance of twenty-six miles, with the mail carrier. The roads were a curiosity in their vileness, an object lesson for road makers. With tons of good macadamizing material laying around, the chuck holes were so many and so deep that it was dangerous to haul even an empty wagon over them. I arrived at Blairsville soaked with water and covered with mud. So far not an insect except a few *Acanthia* that had taken up their abode in the bed I occupied at Blue Ridge. In return for their attentions, in the way of bites, I bottled as many of the bunch as I could catch.

At Blairsville I laid up a day for repairs and washed such of my garments as I could spare and yet keep within the bounds of propriety. I hung these out (in the rain) to dry! Of the eighteen days spent on the trip, it rained sixteen, at least a shower, each day. My outfit for this tramp consisted in a haversack, containing three cyanide bottles, a few small cork-lined boxes and a folding butterfly net, and for a change of clothing, a shirt and pair of socks, and I carried my collecting umbrella. On the morning of June 4 I walked to a place called Young Harris (12 miles) where I arrived at noon. The only insects found en route were a few common beetles and Diptera. Lepidoptera and Hymenoptera were very scarce. The birds observed and noted were mostly common

species, and the "Bob White" was everywhere abundant. Mocking birds were very few. June 6th, taking a guide, I climbed to the top of "Brasstown Bald," the highest mountain in Georgia (4768 feet high). Insects scarce, not a *Cychnus* was seen. A few *Michthysoma heterodoxum* were running, ant like, over the oaks, and some *Corymbites trivittata* were taken flying about. The flora on the top of this mountain is very curious and interesting. The laurels, rhododendrons and azaleas were in perfect bloom and their huge masses of bright colored flowers beautiful in the extreme. The oaks are low, gnarled and crooked, telling very forcibly of their struggle for existence on this wind swept, rocky mountain top. On this date, June 6, their foliage was not fully out. The tender leaves were being eaten up by swarms of "Rose chafers" (*Macrodactylus subspinosus*). The night of June 6th was spent in a hole in the rocks where we slept on a bed of green ferns. At dusk a ruffed grouse drummed his curious muffled love notes, and at day break the ravens sounded their dismal croak. The snowbirds (juncos) were breeding, the males singing their simple cheerful song. Rose-breasted grosbeaks, summer and scarlet tanagers, were also nesting, the males in full plumage and song. The insect collections made were very meagre and disappointing, caused I think by the fires which had swept these mountains, the year before and the cool wet weather. *Cicindela unipunctata*, *patruela* and *sex-guttata* were abundant, as was also a pretty little *Anthrax* fly near *argyramoeba*. A few deer and wild turkeys yet find refuge in these mountain solitudes, we saw traces of both. Reptiles were scarce, but few snakes were seen, none of them venomous. June 8th I walked to Visage, Ga., about nineteen miles, taking a trail through Crow Gap. A beautiful walk, if it had not rained. However when it poured too hard, I opened my umbrella and put in the time digging *coprophagus* *Scarabaeidae*, from piles of animal droppings along the road. Of these ill flavored beetles, I took ten species in this manner. June 10th, rain threatening, I stopped at a house on the road. It poured, so I remained over night, in a bed full of fleas. I captured

nine under my pillow next morning! When I examined my bed I found there were "bed bugs" also in it. All I captured were thin and flat, with no blood in them. Did these enterprising fleas prevent the *Acanthia* from getting any of my blood? The rain leaked through the roof onto my bed, I moved the bed and placed a tin bucket under the leak, but when I looked next morning to see how much water I had caught, there was none there. The bucket had a hole in the bottom and the water had passed down onto the landlord's bed which was in the room below. This roof was like a good many I have seen in Kentucky, when it rains they can't fix them, and when it clears they don't leak. From here to Clayton was a nice walk of about ten miles, easily made in three hours. Here I found Leng and Davis comfortably fixed at the Hotel Dozier which they had turned into a veritable "Bug House." Two days later Dr. Love, of New York, came and we searched the country for miles around for insects. My share of the spoils consisted in about 300 species, 240 of which were coleoptera. Very few were new species, being mostly common things, identical with the fauna of south Ohio and Kentucky. Screamer Mountain yielded a huge cistelid, that is perhaps a new genus, and two clerids that may be new. This mountain (Screamer) has a legend that in early times an Indian chief, suspecting his squaw of infidelity, pursued her, to kill her. He wounded her with an arrow, and she ran screaming up the mountain side. Hence the name of this pretty mountain. Leng smoked the pipe of peace on the mountain top, but forgot his pipe and had to go back after it, when we, on our return and had nearly reached the bottom. This was the most laborious and painful episode of the trip.

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W. S. BLATCHLEY, of Indianapolis, Indiana, has almost ready for the press a descriptive catalogue of the Coleoptera known to occur in Indiana. It will be along the same lines as his "Orthoptera of Indiana," published in 1903, and will be issued as one of the reports of the Indiana Department of Geology and Natural History. Any person outside of the State having examples of rare or interesting species *known to have been taken in Indiana* will confer a favor by sending him data regarding them.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—Ed.

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PHILADELPHIA, PA., NOVEMBER, 1909.

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When this journal was commenced in 1890 we charged one dollar for it and the volume for that year consisted of 168 pages and no illustrations.

The subscribers were pleased with our efforts and gladly paid the dollar for 16 pages per month and no illustrations. Not being published for gain but in the interest of entomology and entomologists all income was put into an increased number of pages and illustrations, the magazine being really a mutual affair for the benefit of its patrons. In our effort to publish the papers that came to us we have steadily increased the number of pages and illustrations.

1890	168 pages	no plates
1905	344 pages	11 plates
1906	404 pages	15 plates
1907	458 pages	17 plates
1908	500 pages	25 plates

We have therefore been giving more for the money than any entomological journal in the world. We can't go on and improve as we would like and the time has arrived to decide whether to maintain the old price or increase it. At the old price of one dollar we would be compelled to refuse papers and many illustrations and on mature consideration decided to increase the subscription price to two dollars a year.

We are doing this in the interest of those persons wishing an avenue of publication for short papers and also in an effort to get papers into print in as short a time as possible. It should also be remembered that at present many more papers are illustrated and for that reason the expense of publication is infinitely greater. It will also enable us to continue to publish the doings of a number of entomological societies throughout the country. The NEWS is about to commence its twenty-first year of existence and its future depends to a great degree on the entomological fraternity. As in the past the editorial board will endeavor to do its part to achieve success. We sincerely hope that this step will meet with the approval of everyone and that the necessity for it will be appreciated. \*

\*This advance will not affect those who have paid their subscriptions for 1910. We do not object to them paying the other dollar if they so desire.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DATES OF GUÉRIN'S *ICONOGRAPHIE REGNE ANIMALI*—The third volume of this work treating of the insects bears the dates 1829-1838 on the title page. Since in the text there are many references to later dates, even to 1844, most writers have given 1844 as the date of the work.

Recently in looking up the name of a flea I find that the plates and text were issued separately, and that 1838 probably represents the completion of the plates. Percheron, 1837, states that the plates were then nearly all published. These plates were issued in fascicles of 10 each; each fascicle was probably mixed groups as Guérin says in a footnote (page 13) that plate II was printed in December, 1836. The composition and date of each fascicle will be of much interest. The text of the work was not issued till 1845. The manuscript was submitted to the institute and approved in November, 1842. The first review of the completed work that I know of is in the "Moniteur Universel," 11 June, 1845, by Bory de Saint Vincent. This is republished in the French Annals for 1845, and also an advertisement of the book. Erichson, in the "Berichte" for 1846 says (p. 66): "The volume is scarcely before 1845 published, and first received in 1846 at Berlin. (Transl.)

The particular case is the genus *Dermatophilus* Guérin, page 14. This

genus does not appear on the plates, only in the text, so cannot date before 1845.

The genus *Sarcopsylla* Westwood was published in 1840, so has priority over *Dermatophilus*. *Rhynchoprion* used by Mr. Baker instead of *Sarcopsylla* is preoccupied by *Rhynchoprion* Hermann 1804 in the Acarians.

All those who hold that a named figure is valid without text must credit such names on Guérin's plates at least as early as 1838; while names only in text should not date before 1845.—N. BANKS.

**THECLA DAMON CRAM. AND ITS VARIETIES.**—This past summer, from July 18th to August 10th, I found *Thecla damon* in unusual abundance on South Mountain, Wernersville, Pa. Unfortunately most of them were faded and worn; but of fifty or sixty specimens sufficiently good to be worth spreading and of several times this number which I rejected, all the females were either the dark form *patersonia*, with no trace of fulvous scales, or intermediate between *patersonia* and typical *damon*, from examples showing faint traces of the fulvous scales on the secondaries to others with fully one-third of the wing-area more or less overlaid with fulvous; all of the males were either the dark form, *patersonia*, the yellow form, *discoidalis*, or intermediate between these, with full intergrades.

*Patersonia* has been recorded from Long Island (Scudder), New Jersey (Brehme), Virginia, South Carolina (Smyth), and I have specimens from Georgia and Delaware as well as Pennsylvania; *discoidalis* was described from a Texas specimen, but Dr. Skinner has it from other localities; both forms occur in the spring and summer broods. . .

Is the absence of typical *damon* at Wernersville due to local and temporary causes,—perhaps the almost unprecedentedly dry season,—or have *patersonia* and *discoidalis* replaced it there?—FRANK MORTON JONES.

**HOPS AND FLIES.**—I was greatly interested last summer and fall in all that appeared in "The Christian Advocate" in regard to abating the house-fly nuisance. My colleague, Miss Blackburn, and I have learned a simple and effective method of freeing a house from the common fly and also from the "blue-bottle," that seems entirely possible to many people unable perhaps to afford methods costing money. To "write it up" for a paper would not be very effective, for my name would carry no weight, but I would like to lay a bit of our experience before you. I am sure you will be interested.

We have observed through more than eight years that in summer our house, unscreened, located in a town and land where filth and rubbish abound as almost nowhere in America, is in the kitchen and dining room wholly free from the pest of flies. We may cook meats,



bake pastry and cakes, can fruit and make jelly all day with wide open doors and windows and not a fly enters. Our kitchen has two windows, one door opening onto a small porch and one door into an inner room. Running over the porch and trained over the two windows of the kitchen are thrifty, common hop vines. They start early in the spring and die down in the late fall. We have believed they gave us freedom from flies but had no absolute proof. Last summer the removal of the vines, temporarily, in order to white-wash the building, gave us what we regard as a demonstration. It was in August. The vines were carefully laid down on the ground while the whitewashing was done, but they had scarcely been so taken from the windows when flies began coming into the room. During the two or three days that the hop vines were down the flies came in so badly we shut our windows. As soon as the work was done we put up the vines as well as possible into their accustomed places, drove out the unwelcome flies, and as a rain came and freshened the vines we again enjoyed freedom from flies. I might say that so slight attention, none in fact, is paid to fly sanitation here that in the summer it requires much grace to force ourselves to enter the average native house.

This quality of the hop vine may be entirely familiar to you, but as I said above, it has never come to my notice in "The Christian Advocate" articles nor indeed elsewhere. And it is so simple and possible that it seems worth while.

Very truly yours,

DORA DAVIS.

Lovetch, Bulgaria, May 4-17, 1909.

—From *The Christian Advocate*.

### NEWSPAPER ENTOMOLOGY.

HER REWARD.—Professor (to his aged cook): "You have now been twenty-five years in my service, Regina. As a reward for your fidelity I have determined to name the bug I recently discovered after you."—*Fliegende Blaetter*.

The Hessian fly is a German product which was conceived in iniquity and born in sauerkraut. It is a long, rangy flea with a bite like a steel trap, and it lays a pale blue, oblong egg at the rate of 30,000 an hour. The Hessian fly will eat anything from decayed custard pie to a glass ink well, but its favorite dish is the double neck on a fat gent. This bird can perform a two-step on sticky fly paper without crooking its toes, and is proof against rough on rats, the daisy fly killer and a strychnine hypodermic. No Hessian fly was ever known to die of anything but old age, which accounts for the color of its whiskers. If it ever fastens upon your jowl, it will stay until removed by the undertaker.—*Manchester Press*.

PARASITE HELPS FARMERS.—GRASSHOPPER PEST IS BEING KILLED OFF IN NORTHERN MICHIGAN.—Marquette, Mich., July 23.—Owing to the appearance of a strange parasite that is killing off the destructive insects, the plague of grasshoppers that has beset the farmers in this part of the country this summer is becoming a thing of the past. F. H. Vandenboom, whose dairy farm at the outskirts of the city is the largest in the upper peninsula, has caught a number of grasshoppers within the last few days, under the wings of which were found a half dozen or more small red eggs, resembling potato bug eggs. From these eggs worms hatch out, which enter the lungs of the grasshopper underneath the wings, and within a short time cause death. It is estimated that grasshoppers have destroyed on an average of 40 per cent. of this year's crop in the upper peninsula.—*Dispatch*, St. Paul, Minn.

The government is importing caterpillars supposed to harbor parasites that are fatal to the *browntail moth*. Supposing the caterpillars multiply like the moth where will be the gain in the exchange of pests?—*Republican*, Faribault, Minn.

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## Doings of Societies.

At a regular meeting of the Feldman Collecting Social held June 16, 1909, at 1523 South Thirteenth Street, Philadelphia, fourteen members were present. President Harbeck in the chair.

Mr. Wenzel said he had noticed a scarcity of the larger Coleoptera in the last few years. Thought perhaps the presence of sparrows accounts for this as these birds are very common especially in "The Neck" where formerly he had found great quantities of large species; now they are entirely absent.

Professor Smith said that in the vicinity of Morris River, N. J., they have reclaimed much of the meadow land. The first year or two these places are covered with a great growth of reeds or rushes. These are plowed under and then strawberries are planted to get the soil in shape for other crops. This year the strawberries were destroyed by a species of *Amara* of the *exarata* section near *rufipes*. This beetle appeared in great numbers and attacked the seeds (making the berries

unfit for market) though it has not lost its predatory habits as a farmer had given him a jar containing hundreds of specimens and he only managed to get about a dozen good ones from it.

Mr. Wenzel remarked on this species, saying he had at one time seen the beach entirely covered with this insect.

Mr. Daecke said he had been to Browns Mills, N. J., over night and had taken at light a dozen specimens of *Lagoa crispata* Payk a species of which he had only taken three specimens in all his collecting experience. Had also found *Chlaenius praeceus* Dej. under a board next day. Reported *Microdon aurulentus* Fab. and *Trichius bibeus* Fab. from Dauphin Co. VI-6-09, and *Myrmecomyia myrmecoides* and *Idana marginata* Say. from Harrisburg. Also exhibited a specimen of *Leptura proxima* Say., a freak with three antennae collected by Mr. Chamberlain.

Mr. Wenzel said he had found this *Leptura* and *Buprestis rufipes* Oliv. in great numbers under bark where they had died before working their way to the surface.

Mr. Harbeck exhibited specimens of *Asilus flavofemoratus* Hine, *A. fuscatus* Hine, *A. auricomus* Hine, *A. lecythus* Walker and *A. sadytus* Walker, all taken within a few miles of Philadelphia and stated that Professor Hine had been working on a revision of this difficult group with satisfactory results which will be published within a short time.

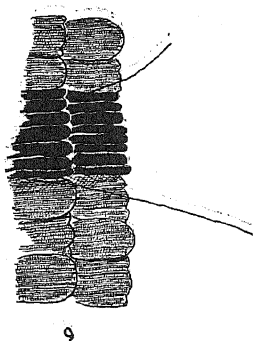
Mr. George M. Greene reported that he had put a dried specimen of *Coptocycla* in the relaxing jar and when it had become moist it resumed its natural golden color. Also said that live specimens of the Japanese Mantis had been placed in the woods at Roxborough and had been seen there alive a few weeks later, proving they had found food upon which to live.

Mr. C. T. Greene exhibited a specimen of *Volucella vesiculosa* Fabr. from Castle Rock, Pa. VI.-6-09.

Meeting adjourned to the annex.

GEORGE M. GREENE, Secretary.





ALLEN ON ANOSIA PLEXIPUS.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XX.

DECEMBER, 1909.

NO. 10.

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### Variations in the Wing Scales of *Anosia plexippus*.\*

By ANNA ALLEN.

(Plates XX, XXI, XXII)

In studying the Lepidoptera, there has often arisen the question as to whether scale characteristics might be used as a means of identification. In 1762, Lyonet stated that "butterflies" might be recognized by their scales, and made an extensive study of those of the goat moth. Schneider, '78, describes typical scales from characteristic regions of a large number of species. Kellogg, '94, made an extensive study of the taxonomic value of butterfly scales, and gives a classification of the *Jugatae* upon that basis.

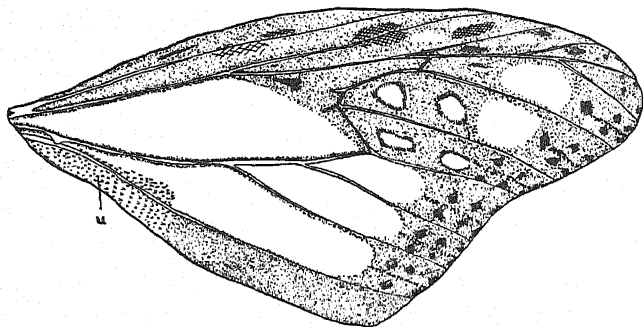
The present study was undertaken because of the interest aroused in the "scent pocket" of *Anosia plexippus*, our common milkweed butterfly. Certain peculiarly modified scales, the androconia, are found within this pocket. In introduction to the study of these scales, a study of all the wing scales was made. An astonishing variety of forms was found, with indications of definite arrangement upon characteristic regions of the wing. For this reason, a detailed regional study, more especially of the hind wing was undertaken.

\* Contribution from the Entomological Department of Cornell University.

The regions chosen are shown in the accompanying illustration. (Fig. 1). They are:

1. General surface area, including a vein, A.
2. Four marginal sections, basal anal, B; outer anal, C; central costal, D; and basal costal, E.
3. Central basal, F.
4. Scent pocket, G.

Widely differing scales occur in these regions. A typical form may be described as a bilaterally symmetrical membranous sac, more or less oval in outline with lobes or apices at the free end, and an indentation, or sinus, at the base. In the center of the sinus is the stalk with its more or less bulbous form fitting into the socket in the membrane of the wing (C. 15). Variations occur in color, in the relative length and breadth of the scale, the number of lobes or apices, the depth of the sinus, and in form itself. Some are nearly triangular, others are unsymmetrical with the sinus much nearer one side than the other.



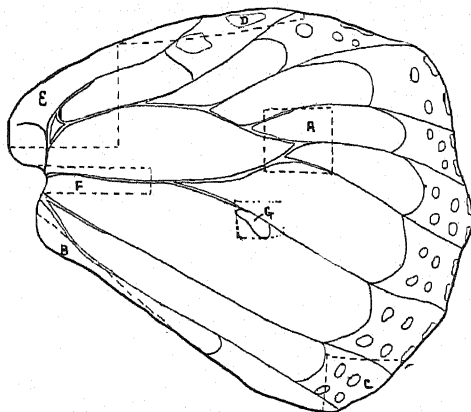
Lower surface of forewing of *Anosia* showing distribution of color and location of the unsymmetrical scales of the "locking device"; *u* = unsymmetrical scales Mag.  $\times 1\frac{1}{2}$ .

In color, the wings of *Anosia* are a deep reddish orange (unshaded in figures 2 and 3), with a wide black border which in the forewings covers a large part of the surface. This border is interrupted by a more or less regular double row of white spots. The brown spots are frequently bordered with white scales, and have white scales interspersed with the brown ones, forming lighter brown areas. (Fig. 2). This is particularly true of the underside of the forewing. The arrangement of the scales is in regular overlapping rows which are approximately perpendicular to the veins. These rows continue regu-

larly through the spots, the difference being purely one of color. The scales of the spots are usually more notched than the typical surface scale, but so also are all those in the vicinity of the margin.

The scales of the general surface, as illustrated in A Plate I, closely approach the type form. They are broad usually with a one or three lobed apex (2-3). In the case of the upper surface of the forewing, all the scales are notched, those with several sharp apices predominating. On the lower side of the hind wing, there is seen a tendency toward a more rounded condition of the lobes, and an alternation of the two and four lobed types. On the upper side of the hind wing and the lower side of the forewing, however, an alternation of the one and the three lobed types is conspicuous.

The veins are covered and bordered with closely crowded narrow scales, their width about one-fourth that of the typical surface scale. These scales are usually black, though in regions near the base of the wing, they are frequently brown or yellow. On the lower surface, the scales bordering the veins are interspersed with a few white ones. On the upper surface, dark-



Hind wing of *Anosia* showing regions chosen as typical. Mag.  $\times 1\frac{1}{2}$ .

er brown ones are mingled with the others. Here, too, the vein scales almost invariably have entire margins, while on the lower surface, they are notched A. 7-8.



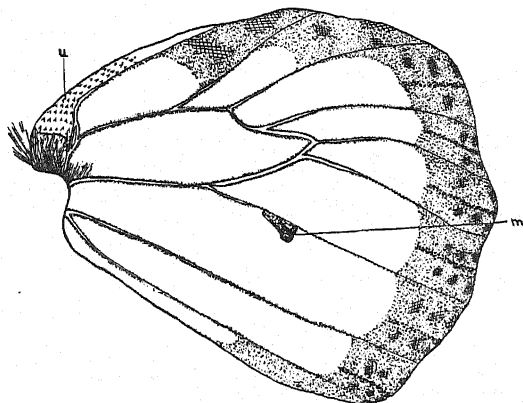
The marginal areas may be considered next. Scales from four typical regions were studied. The basal anal region, seen in B, is marked by its general covering of symmetrical white scales crowded upon the surface. Schneider describes as characteristic of this region in several families, three peculiar types of scales, one of which closely approaches the unsymmetrical form occurring in another portion of the wing; but these types were not found in *Anosia*. Along the immediate margin, appear long plumose hairlike scales. B. 10-12. Along the outer margin, as represented in C, the characteristic fringe scales predominate. These scales closely overlap, appearing to be in several layers. The general surface scales grade into these long and sharply notched ones. There is wide variation in the size and shape of the type, as seen in (C. 17-19). In size, they range from 0.2 mm. to 0.5 mm.; in shape, from rounded scales to characteristic triangular ones with several sharp apices (C. 19). At region D, the central costal area, these fringe scales are somewhat shorter (D. 22, Plate II). The common surface type and the hairlike plumose ones also occur.

The scales of region E, the basal costal area, are among the most peculiar of the whole wing surface. It is here that the unsymmetrical scales are found (E. 32). These scales have a single sharp apex, the lobe at one side of the sinus much larger than the one on the opposite side, and are marked with oblique striations. It was a type approaching this form that Schneider found not only here, but also along the inner margin of the wing. These peculiar scales occur also on the lower surface of the basal anal region of the forewing (E. 33). In studying their general arrangement, it was noted that their tips stand away from the wing membrane and are also directed away from the margin of the wing. The two regions where these scales occur, overlap. Owing to their projecting tips and oblique arrangement, they might well serve as a "locking device" for the two wings, thus holding them so closely together that they act as one membrane. Occurring also, where Schneider found them, in the region adjacent to the insect's body, they might

serve there, too, a similar function. Scales of this type were found in the same two regions in *Papilio polyxenes* and in *Argynnis*, and are probably of common occurrence in these regions on butterfly wings.

The central basal area, F, is characterized by tufts of hairlike scales both simple and plumose (F. 38-40, Plate III). These hairlike scales are also sparsely scattered along the veins A 9, and occur with the fringe scales at the margin.

The "scent pocket" alluded to, is located on vein Cubitus 2. It is illustrated as region G. This pocket, black in color, is a conspicuous characteristic of the male of *Anosia plexippus*. Within it, are the most remarkable scales of the wing, the androconia. They are connected with the scent glands whose secretion is poured out over the surface of the scales. From the nature of these scales, Dr. W. A. Riley suggests as a name for the pocket, "murotheca," which means perfume box. The



Upper surface of hind wing of *Anosia* showing unsymmetrical scales *u* and the murotheca *m*. Mag.  $\times 1\frac{1}{2}$ .

androconia are needle like in shape (G. 42-43). They are scattered amongst small black scales about 0.07 mm. in length, which have usually an entire margin. Scudder describes both of these forms as androconia.

These companion scales present a noteworthy appearance (G. 44-45). Their characteristics are their small size and irregular arrangement. All the scales described above are

marked by prominent longitudinal striae about 0.002 mm. apart, and by less distinct cross striations. Owing to the heavy pigmentation of these companion scales, their striae were for some time thought to be absent. We have seen that the rows of scales are usually perpendicular to the vein. In the region of the murotheca, however, the rows instead of presenting this appearance, change their direction and assume an almost radial arrangement, the scales in the immediate vicinity of the pocket standing with their axes perpendicular to the vein (G. 41).

In length, the wing scales of this butterfly vary from 0.07 mm. in the case of the androconia and companion scales of the murotheca, through 0.12 mm. in the scales of the general surface, and 0.5 mm. in the fringe scales to several times that length in the case of hairs.

From this brief account of the various types of scales found upon the wings of *Anosia plexippus*, will be appreciated a few of the obstacles to be overcome before a realization is possible of Lyonet's statement\* that, were anyone to take the pains, he might recognize the species of butterflies from their scales, just as a botanist recognizes a plant by its leaves. Not only do a great variety of scales occur in a single species, but many gradations between the types are found.

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\*"Chaque espèce de papillon a des écailles faites dans un goût qui lui est particulier, et par où celui qui voudroit en prendre la peine pourroit se mettre en état de reconnoître, à la vue de quelques écailles, l'espèce de papillons à laquelle elles appartiennent, comme un pépiniériste reconnoit les arbres, et un botaniste les plantes à leurs feuilles." Lyonet then states that one could not but be surprised by the astounding variety of forms occurring in a single species, not only upon the wings, but upon the body as well.

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#### EXPLANATION OF PLATES.

##### PLATE XX.

A. Scales of the general surface, including a vein area.

1. Hair-like plumose scale.

2-3. Typical surface scales. Length, .12 mm. 40 striae .00196 mm. apart.

4. Variation in form of sinus.
  - 5-6. Variations in apices.
  7. Vein scale of upper surface.
  8. Vein scale of lower surface.
  9. General view of vein with hair-like scales scattered on its surface.
  - B. Scales of the basal anal area.
    - 10, 11, 12. Hair-like scales of the margin.
    - 13-14. Surface scales.
  - C. Scales of the outer anal area.
    - 15-19. Gradations from surface type to triangular fringe type.
    15. Length, .14-.21 mm. 40 striae .00215 mm. apart.
    16. Length, .16 mm. 31-32 striae .00245 mm. apart.
    17. Length, .21 mm.
    18. Length, .28-.34 mm.
    19. Length, .42-.5 mm. 31 striae .00218 mm. apart.
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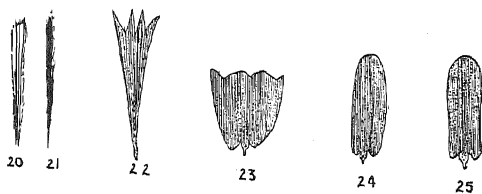
## PLATE XXI.

- D. Scales of the central costal area.
    - 20-21. Hair-like plumose forms.
    22. Short fringe type.
    - 23-25. Surface types.
    23. Length, .124 mm. 36 striae .00239 mm. apart.
  - E. Scales of the basal costal area.
    26. General view of the region.
    27. Hair-like type.
    - 28-29. Unsymmetrical forms with oblique striations. Length, .098 mm. 18 striae .0027 mm. apart.
    - 30-31. Variations of the general surface type occurring here. Length, .15 mm. 38 striae .0017 mm. apart.
    32. Enlarged view of the unsymmetrical scale.
    33. View of the lower surface of the basal anal region of the forewing.
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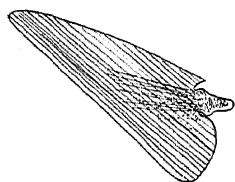
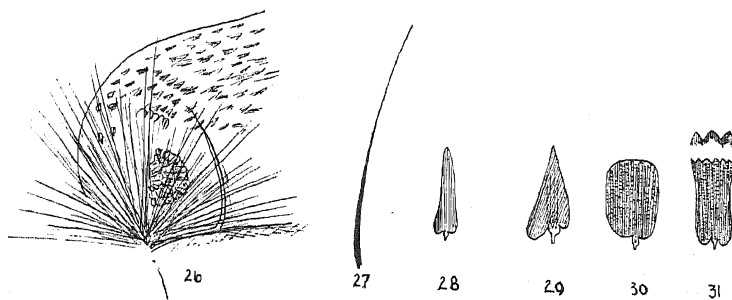
## PLATE XXII.

- F. Scales of the central costal area.
  - 34-37. Variations of the typical surface scale.
  35. Length, .14 mm. 40 striae .0017 mm. apart.
  36. Length, .18 mm. 22 striae .00175 mm. apart.
  - 38-40. Hair-like types conspicuous in this region.
- G. Scales of the muretheca and adjacent area.
  41. View of the arrangement of scales in this region.
  - 42-43. Androconia. Length, .055-.07 mm.
  - 44-45. Companion scales. Length, .07 mm. Striations visible only at the base or margin of a few scales.
  46. One of the plumose hair-like forms occurring upon the vein.
  47. Outline of typical scales to show the relative size of the androconia and companion scales.

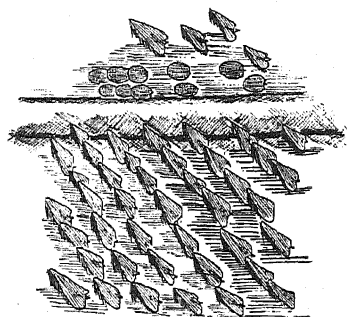
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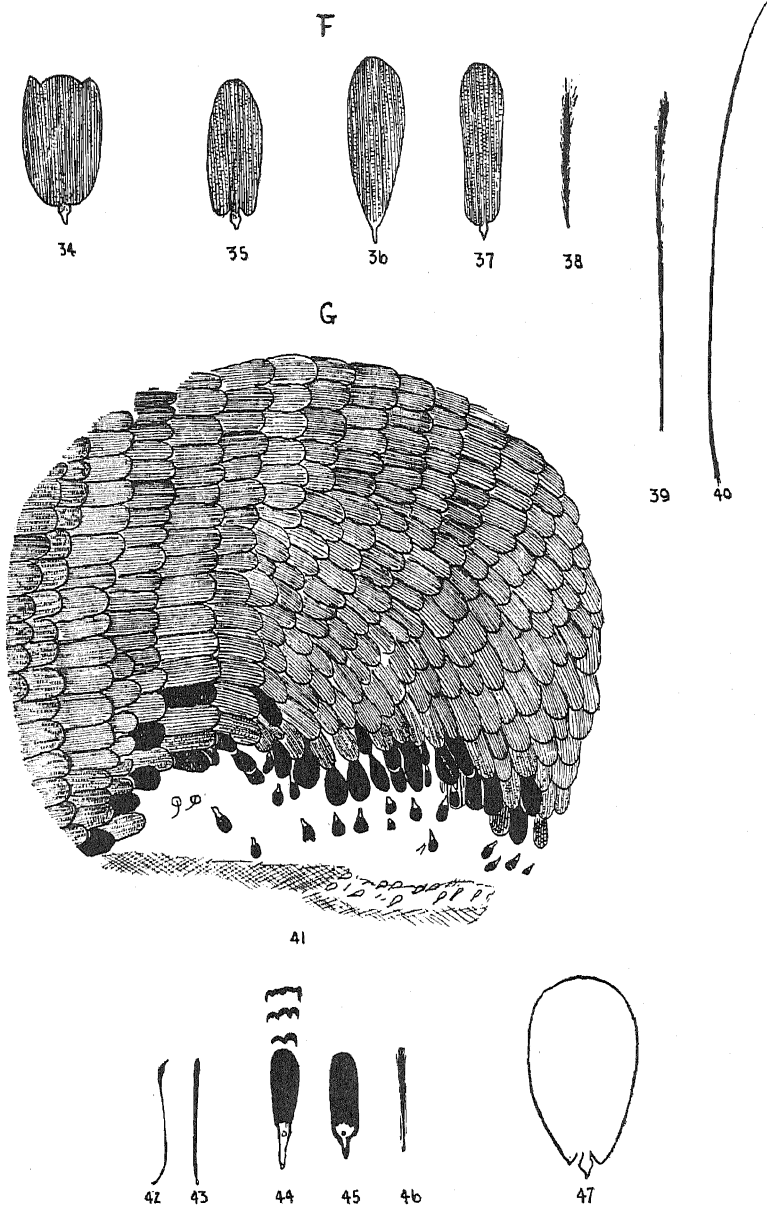
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ALLEN ON ANOSIA PLEXIPUS.





ALLEN ON ANOSIA PLEXIPUS.





## The First Central American Corduline.

By PHILIP P. CALVERT.

In 1897, Prof. G. H. Carpenter, in an article on the geographical distribution of the Odonata,\* pointed out the absence of the Cordulinae from Mexico and Central America. Not having succeeded in finding any specimens or records of this subfamily from these countries (except a single mention of *Macromia* larvæ from Northern Mexico), when preparing the account of the Odonata for the *Biologia Centrali Americana*,† I have emphasized in a recent paper‡ the absence of the Cordulinae as one of the characteristics of these areas. As an undoubted member of the group has now been discovered in Costa Rica, I wish to correct the erroneous idea for which I have stood sponsor.

In June, 1909, while enjoying the hospitality of the United Fruit Company, at the house of Superintendent E. W. F. Reed, at Guapiles, Costa Rica, it was my good fortune to find there Messrs. William Schaus and John Barnes, whose labors on the Lepidopterous fauna of Costa Rica are the most extensive yet undertaken and to whose knowledge of the country I am greatly indebted. While at Guapiles we collected Lepidoptera and Odonata, sometimes together, sometimes separately. On one of the latter occasions, on June 4, 1909, Mr. Barnes took a single male of the species described below, in what is locally known as the Florida road, a trail passable for horse and pedestrian, running westward into the virgin forest from near San Jacinto, a hacienda a few miles west of Guapiles. The elevation of Guapiles accepted by Prof. Pittier is 300 metres, and that of the locality here in question can not be very different.

Of the Corduline nature of this male there can be no doubt as it possesses the following characters laid down for that sub-

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\*Scientific Proceedings, Royal Dublin Society (new series), Vol. VIII, p. 450.

†Cf. volume Neuroptera, pp. 197-198, 1905.

‡"The Composition and Ecological Relations of the Odonate Fauna of Mexico and Central America," Proceedings of the Academy of Natural Sciences of Philadelphia for 1908, p. 461.

family by de Selys: Eyes posteriorly with a graniform prolongation, a bundle of hairs at the external antero-distal extremity of the first femur, first tibia with an inferior distal lamella, auricles on the sides of the second abdominal segment, hind wing with the anal margin excavated and with an anal triangle.

The other members of the genus *Neocordulia*, to which this newly-found insect belongs, are Brazilian and none have yet been found in the territory between Brazil and Costa Rica.

***Neocordulia longipollex* n. sp.**

♂ Vertex and frons metallic purple, the former rounded and convex at tip, the latter with a deep median groove, both punctate and clothed with blackish hairs. Nasus and labrum black, rhinarium and labrum reddish brown, occiput and rear of the head black, hairs on the rear of the head yellowish or pale brown, on the other parts named darker.

Thorax brilliant metallic green with bluish reflections, most of the pectus reddish brown; clothed on all sides with hairs, mostly pale colored, except on the upper parts of the mesepisterna, where they are fuscous, longest on the lower parts of the sclerites named.

Abdomen enlarged at segments 2 and 7-10; black, ventral margins of the tergites of 2-8 narrowly cream colored or yellow. Segment 10 with a mid-dorsal carina continued into a mid-dorsal prolongation of the posterior margin of the segment.

Superior appendages as long as 9 and 10, in dorsal view straight, slightly enlarged at the apex which is somewhat rounded laterally and slightly truncated mesially; in profile view barely convex superiorly, slightly enlarged at the apex which is rounded; except for the slight apical enlargement the appendages are of subuniform thickness and possess no teeth or spines.

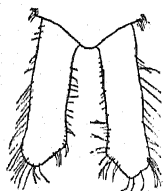


Fig. 1.—Superior abdominal appendages ♂, dorsal view. x10.

Inferior appendage longer than ( $1\frac{1}{4}$  times as long as) the superiors; in profile view a little concave superiorly with a slight superior convexity at one-third length; in ventral view its truncated apex is half as wide as its base, each of the two apical angles terminating in a small upturned tooth.

Genitalia of abdominal segment 2: anterior lamina concave, concealed in profile view by the sides of the segment; hamule two-branched, posterior branch the larger, depressed, its apex rounded horizontally, anterior branch more prominent, terminating in a slender hook directed caudad, mesad and finally dorsad; genital lobe subequally prominent with the posterior hamular branch, a little narrower at its

rounded apex than at its base, hairy. In the unique specimen the basal part of the penis projects beyond any of the genitalia above described and the vesicle of the penis is as prominent as the genital lobe.

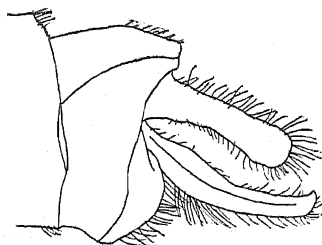


Fig. 2.—Apex of abdomen ♂, left side, profile view.  $\times 10$ .



Fig. 3.—Inferior appendage ♂, ventral view.  $\times 10$ .

Dimensions: Abdomen (incl. apps.) 39, superior appendages 2, hind wing 34, costal edge of stigma of front wing 2.5, maximum width of hind wing (at level of separation of  $M_1 + 2$  and  $M_3$ ) 11.5 mm.



Fig. 4.—Genitalia of second abdominal segment ♂, inverted. Left side, profile view,  $\times 10$ .

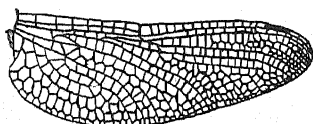


Fig. 5.—Wings of left side ♂, from below. Slightly more than natural size.

Legs mostly black but the coxae, trochanters and proximal ends of the femora reddish-brown.

Wings uncolored, stigmata and venation dark brown or black, all the triangles and supratrangular areas free, two post-triangular rows from the discoidal triangle out to the level of the fourth postnodal (front wings) or of the nodus (hind wings), one row of cells between

$R_s$  (subnodal sector of de Selys) and the supplementary sector next below, arculus between the first and second antenodals, distinctly nearer to the latter, and proximal to the proximal side of the discoidal triangle.

Front wings with 13-14 antenodals, 11 postnodals, one cubito-anal (submedian, de Selys) cross-vein,  $M_4$  (short sector) and  $Cu$ , upper sector of the triangle) subparallel a little nearer together at the level of the second postnodal.

Hind wings with 8-7 antenodals, 14 postnodals, two cubito-anal cross-veins, the distal one coinciding with the arculus, membranule pale brown, anal triangle two-celled.

♀. Unknown.

*Hab.*—Costa Rica, forest west of Guapiles, as above described. Male type in collection of P. P. Calvert.

The specific name proposed alludes to the length of the inferior appendage of the male which acts as an opposable organ (hence *pollex*) in grasping the female.

The figures illustrating the appendages of the abdomen and the genitalia have been drawn from under the compound microscope with the camera lucida. The wings were photographed to as large a scale as our camera permitted, a blue print made from the negative, the veins inked with waterproof black ink, the blue background washed to white with ammonia water and "copy" thus obtained for the engraver.

Having very little literature on the Odonata accessible to me at present, I have asked Mr. E. B. Williamson to look over the manuscript of this paper and correct it where necessary.

Cartago, Costa Rica, October, 1909.

Dr. Calvert's interesting new species seems to be most closely related to *Neocordulia batesi* Selys, recorded by Martin, from Brazil and Ecuador. In *batesi* the superior appendages, as in *longipollex*, are without any promiencences but are conspicuously dilated apically as opposed to the subuniform thickness of the appendages throughout in *longipollex*; and the inferior appendage is shorter than the superiors, not greatly exceeding them as is the case in *longipollex*. No changes have been made in Dr. Calvert's manuscript. E. B. W.

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## The Bees of Virginia—*Prosopis*, *Sphecodes*, *Osmia*.

By JOHN H. LOVELL, Waldoboro, Maine.

The bees of the southern states are so imperfectly known that collections from any part of this region possess more than usual interest. Some months ago I received from Dr. Nathan Banks for determination a collection of bees largely from Virginia belonging to the genera, *Osmia*, *Sphecodes* and *Prosopis*. Only a few species of *Osmia* and *Prosopis* have been recorded from this state, while the genus *Sphecodes* is wholly unknown from this area. A list of the species is as follows:

**PROSOPIS.**

Of the five species of *Prosopis* enumerated in this paper four occur also in the northeastern states, while one, *P. minyra*, is described as new. If specimens of *Prosopis* with yellow markings are left too long in the cyanide jar the yellow marks change to red. Even dried specimens, if exposed to the action of cyanide of potassium, will undergo a similar change. The yellow coloration of some species of wasps under these conditions also becomes red. Such artificial color changes, if unknown, might easily lead to mistakes in identifications.

***Prosopis pygmaea* Cr.**

♀. Falls Church, Va., May 30, on flowers of *Castanea pumila*, June 22, July 6, on flowers of *Ceanothus*, N. Banks.

***Prosopis verticalis* Cr.**

As the female has never been described it is deemed desirable to give the more important characters:

♀.—Length about 6mm., larger than the male which it closely resembles. Deep black; the bow-shaped marks on each side of the face and the tubercles are yellow (the collar and tegulae are dark); the anterior and intermediate legs wholly black, the posterior legs have the tibiae yellow at base. Head longer than broad, the clypeus is distinctly but sparsely punctured, the face closely and evenly punctured. Mesothorax opaque, the punctures small and very evenly distributed. Wings nearly hyaline, stigma and nervures fuscous. Enclosure of metathorax well-defined, irregularly and finely reticulated (in the male the rugae are more nearly parallel). The first abdominal segment is smooth and shining, with patches of white pubescence on the apical lateral margins.

Two females collected at Falls Church, Va., on May 24; one male at Falls Church, Va., May 24, N. Banks.

***Prosopis minyra* n. sp.**

♂.—Length about 4 mm. The clypeus, supraclypeus and the sides of the face are yellow; the upward extensions of the lateral face marks are short and obliquely truncate; two spots on the collar and the tubercles, the anterior tibiae in front, the intermediate tibiae at base and apex (slightly), the posterior tibiae at base and all the tarsi, yellow. Head about as broad as long, the face narrowed below, the punctures of the face and mesothorax are close and small. Antennae black, the scape normal, the flagellum is fuscous in front, light brown behind. Wings nearly hyaline, iridescent, the nervures and stigma are fuscous, the

tegulae nearly dark brown. Enclosure of metathorax semicircular, strongly pitted. The first abdominal segment smooth and shining, the compound microscope shows that it is nearly impunctate in the center and sparsely and very finely punctate on the sides.

Type from Church Bridge, Va., June 9, N. Banks. About the size of *P. pygamaea* from which the form of the face marks and the spots on the collar easily distinguish it. The face marks resemble those of *P. ziziae*, from which it differs in its smaller size and the absence of yellow spots on the scapes and tegulae. The shade of yellow of the markings is not stated in the description as they had been reddened in the cyanide jar; but, so far as can be inferred, they were lemon yellow.

***Prosopis ziziae* Robt.**

♀. Falls Church, Va., May 20, May 30, on flowers of *Castanea pumila*, June 14, July 6, N. Banks.

♂. Falls Church, Va., June 2, on flowers of *Castanea pumila*, June 9, N. Banks, also two specimens from Ithaca, N. Y.

***Prosopis modesta* Say.**

As Say's type is no longer in existence and his description is very brief, the correct identification of this species has been regarded as doubtful. In another paper I hope to show that Say's species can be determined with a high degree of certainty. I have examined the common species of Indiana (the probable type locality) belonging to this genus, and have obtained figures and new descriptions of *P. affinis* Sm. prepared by Col. Bingham from the types in the British Museum, with which *P. modesta* has frequently been confounded. The name has been so long and so widely used that it is desirable to retain it if possible.

♀. Falls Church, May 14, May 30, on *Castanea pumila*, June 2, on *Castanea pumila*, June 14, July 5 on *Ceanothus*, July 16, Aug. 5; Great Falls, Va., June 7, July 17; Church Bridge, Va., June 9; Glencarlyn, Va., July 2, July 28 on *Ceanothus*; Washington, D. C., July 21; Sea Cliff, N. Y., collected by Nathan Banks.

♂. Falls Church, Va., May 30 on flowers of *Castanea pumila*, June 7, June 24, June 27, July 5, July 20, Aug. 2; Great Falls, Va., May 22, June 7, Sea Cliff, N. Y.; June, N. Banks.

The first abdominal segment is usually finely and sparsely punctured, but occasionally on the center or disc the punctures are very few in number and cannot be clearly distinguished without the aid of the compound microscope, but on the sides of the segment they still remain numerous. The color of the markings is pale or lemon yellow.

### SPHECODES.

As it is necessary to determine whether the mandibles of species of *Sphecodes* are simple or dentate they should be spread when the specimens are collected. If this is omitted it is often necessary to relax them, and the moisture of the relaxing jar may largely increase the area of black coloration upon the abdomen. The color of the abdomen should, of course, always be carefully noted and recorded before the specimens are placed in the jar.

#### ***Sphecodes dichrous* Sm.**

♂. Falls Church, Va., Aug. 2 on flowers of sumach; Great Falls, July 12, N. Banks.

#### ***Sphecodes obscurans* Lov. and Ckll.**

♀. Sea Cliff, N. Y., N. Banks.

#### ***Sphecodes heraclei* Rob.**

♀. Falls Church, Va., July 17, N. Banks.

♂. Falls Church, Va., July 17, N. Banks.

This species is easily identified by the tubercle on the vertex of the head.

#### ***Sphecodes confertus* Say.**

♀. Great Falls, Va., May 22; Falls Church, Va., June 2; also Ithaca, N. Y., N. Banks.

#### ***Sphecodes ranunculi* Robt.**

♀. Falls Church, Va., June 2, June 23 on flowers of *Ceanothus*, N. Banks.

♂. Falls Church, Va., May 10, May 24, N. Banks.



***Sphecodes mandibularis* Cr.**

♀. Sea Cliff, N. Y., N. Banks.

***Sphecodes illinoiensis* Robt.**

♀. Glencarlyn, Va., May 9, N. Banks.

***Sphecodes stygius* Robt.**

♀. Falls Church, Va., July 16, July 17 on flowers of *Angelica villosa*, Aug. 5, N. Banks.

***Sphecodes banksii* n. sp.**

♀.—Length 3-4 mm. Head and thorax black; abdomen red, the apical segments clouded with black. Head about as broad as long; mandibles simple, yellowish-red the apices darker; face finely and densely punctured, clothed with thin, white hair; labrum sometimes reddish, clypeus smooth and shining almost impunctate; antennae brownish-black, flagella reddish brown. Mesothorax smooth and shining, with small, sparse punctures; tubercles red. Enclosure of metathorax well-defined, with parallel ridges. Wings hyaline faintly tinged with fuscous, iridescent, nervures and stigma fuscous; tegulae reddish testaceous; second submarginal cell narrow, the sides nearly parallel. Legs reddish-brown, clothed with silvery white hair. Abdominal segments 1-3 light or yellowish-red, the apical segments not deeply shaded with black; basal segment with a few fine punctures, the other segments finely and closely punctured all over except on the apical margins.

The description is based on four female specimens from Sea Cliff, Long Island, N. Y., N. Banks. This is a very distinct form and I know of no other species in North America with which it can be compared. The species is dedicated to Dr. Nathan Banks.

***Sphecodes distolus* n. sp.**

♀.—Length 6 mm. Head and thorax black; abdomen largely red, the apical segments only partially black. Head broader than long; mandibles red with darker apices, bidentate; clypeus without a median suture, with small rather close punctures; face very finely and densely punctured; antennae black, flagella reddish brown, joints 3 and 4 nearly equal. Mesothorax finely and densely punctured, wings hyaline, stigma, nervures and tegulae pale fuscous, the first transverse cubital nervure is absent and there are only two submarginal cells, the first of the two cells is nearly three times the length of the second, the venation (except the radial nervure) beyond the basal nervure is subobsolete. The enclosure of the metathorax is well-defined, the center smooth and shining

with about three ridges on each side. The trochanters are largely red, the femora largely black, all the tibiae and tarsi are red. Abdominal segments 1-3 are chestnut red, segment 4 is black in the center, segment 5 largely black; segment 1 is nearly impunctate, with a few, fine, widely scattered punctures; the other segments have very fine, shallow punctures except on the apical margins.

One specimen from Great Falls, Va., July 17, N. Banks. *S. Distolus* differs from *S. (Dialonia) antennariae*, which also has only two submarginal cells, in its larger size, dentate mandibles, black mesothorax with coarser punctuation, venation and color of abdomen.

#### OSMIA.

##### *Osmia lignaria* Say.

♀. Falls Church, Va., April 18; Glencarlyn, Va., May 4, N. Banks. ♂. Falls Church, Va., April 18, N. Banks.

##### *Osmia melanotricha* Lov. and Ckll.

♀. Glencarlyn, Va., May 4; Great Falls, Va., June 25, *S. distolus* differs from *S. (Dialonia) antennariae*, which also been found in Colorado. The type locality is Maine.

##### *Osmia pumila* Cr.

♀. Great Falls, Va., May 22, June 7; Glencarlyn, Va., May 4, May 10, N. Banks.

♂. Falls Church, Va., April 26 on flowers of *Waldsteinia*; Glencarlyn, Va., May 4, N. Banks.

##### *Osmia purpurea* Cr.

♀. Falls Church, Va., May 24, June 2, June 24, N. Banks. This species, says Cresson, may be readily distinguished by the dark purple coloring and the narrow fasciae of the abdomen. The mandibles are 4-dentate.

##### *Osmia rustica* Cr.

♂. Falls Church, Va., May 24, June 2, N. Banks.

##### *Osmia georgica* Cr.

♀. Falls Church, Va., May 29, N. Banks.

## New Aleocharinae (Staphylinidae, Col.) of the U. S.

By A. FENYES, Pasadena, Cal.

### 1. *Silusa densa* Brnh., i, litt. spec. nov.

Moderately depressed, parallel, with sparse, yellow pubescence.

Head black, opaque; prothorax piceous brown, opaque; elytra reddish brown with a large triangular scutellar and still larger triangular external marginal area piceous brown, so that the ground color appears only on a narrow oblique semi-lunar vitta, reaching from humerus to apical sutural angle, opaque abdomen piceous black, at apex lighter, a little shining; antennae piceous, paler toward base; legs pale dirty reddish.

Antennae about as long as head and prothorax together, strongly incrassate toward apex; joint 2 longer than 3; 4 small, transverse; 5-10 gradually wider, transverse, the penultimate joints almost twice as wide as long; 11 about as long as 9 and 10 together, large, oval.

Head transverse, very finely, not densely punctate; eyes large, prominent, longer than the tempora; genae entirely margined.

Prothorax a little wider than the head, transverse, about two-thirds wider than long, sides and base rounded a little narrower in front than behind; hind angles obtuse, blunt; moderately densely and finely punctate.

Elytra a little wider and a little longer than the prothorax, outer hind angles strongly emarginate; moderately, a little coarsely, quite densely granulosely punctate.

Abdomen parallel; segments 3-6 transversely impressed at base; at base a little coarsely and more densely, at apex more finely and sparsely punctate.

In the male the 7 dorsal segment of the abdomen with a short carinula in the middle before the apex; 8 dorsal segment at apex truncate emarginate, with sharp crenulations.

Length, 2.6 mm.

Pasadena, in California, under sycamore bark.

### 2. *Silusa opaca* spec. nov.

Rather robust, moderately convex, subparallel, inconspicuously pubescent.

Head black, opaque; prothorax and elytra piceous red, vaguely darkly suffused, opaque; abdomen piceous black, apical segmental margins and apex vaguely piceous red, a little shining; antennae piceous brown, joints 1-3 and 11 reddish yellow; legs reddish yellow.

Antennae about as long as head and prothorax together, moderately incrassate toward apex; joints 2 and 3 subequal; 4 moderately, 5-10 strongly transverse; 11 scarcely as long as 9 and 10 together, oval, pointed.

Head much narrower than the prothorax, transverse; extremely densely and extremely finely punctate; eyes large, tempora short, genae entirely margined.

Prothorax almost as wide as the elytra, strongly transverse, about two-thirds wider than long, narrower in front than behind; sides and base rounded, the latter at the sides sinuate, hind angles obtuse; convex, with a faint transverse basal depression extremely densely and very finely punctate.

Elytra considerably longer than the prothorax, hind angles strongly emarginate; extremely densely and finely, somewhat roughly punctate.

Abdomen subparallel; segments 3-5 transversely impressed at base; rather densely, not finely punctate.

In the male the 7 dorsal segment of the abdomen in the middle very near to the apex with a scarcely visible small tubercle; 8 dorsal segment at apex truncate, with 4-5 rather prominent teeth in the middle, at each side with another, more prominent, longer tooth.

Length, 2.2-2.4 mm.

Tahoe City, Deer Park Springs, Tallac, in California, on mushrooms and toadstools.

3. *Atheta (Halobrectha) algophila* spec. nov.

Moderately elongate, moderately depressed, almost parallel.

Piceous black, moderately shining, abdomen a little more shining, elytra and apex of abdomen sometimes a little lighter; antennae reddish brown, the first three or six joints, mouth and legs lighter, reddish yellow.

Antennae moderately long, longer than head and prothorax together, moderately pubescent and setulose; joints 1, 2 and 3 elongate, 2 longer than 3; 4 and 5 longer than wide, 4-10 gradually a little shorter and wider, the penultimate joints one-half wider than long; 11 not quite as long as 9 and 10 together, oval, with blunt apex.

Head a little narrower than the prothorax, longer than wide, rounded, with prominent mandibles; coarsely and moderately densely punctate, with an impunctate middle area; with sparse yellowish pubescence; eyes rather small, almost shorter than the tempora; genae entirely margined.

Prothorax narrower than the elytra, about one-third wider than long, sides conspicuously rounded, narrowed behind, hind angles obtuse, moderately densely and finely punctate, with sparse yellow pubescence; with a shallow transverse basal foveola and two side bristles.

Elytra wider and about one-third longer than the prothorax, together almost longer than wide, almost parallel; outer hind angles conspicuously emarginate; densely and finely punctate, with moderately sparse, conspicuous yellowish pubescence.

Abdomen but very little narrowed behind; segments 3-5 transversely impressed at base; finely and sparsely punctate, segments 6 and 7 still more sparsely punctate, almost smooth.

Nails long, toothed at base.

Mesosternum carinate in the middle in front, very pointed behind, entering about three-fourths between the middle coxae, the latter moderately separated.

Metasternum pointed in front, entering a little between the middle coxae; a very short isthmus between the two sternal points.

In the male the 8 dorsal segment of the abdomen rounded; the 6 ventral segment a little produced, narrowed at apex.

In the female the 8 dorsal segment rounded; 6 ventral segment scarcely produced, rounded, not narrowed at apex.

Length, 2.6-3 mm.

San Diego, in California, under seaweed on the ocean shore.

4. *Atheta* (*Atheta*) *hilaris* spec. nov.

Moderately elongate, a little narrowed in front and behind.

Head black, very little shining; prothorax piceous black, with the margins sometimes lighter, moderately shining; elytra testaceous, with a vaguely defined black area around the scutel and a large, triangular black spot at the hind angles, moderately shining; abdomen yellow in front, from segment 5 on black, the centers of the yellow segments with a vague blackish cloud; antennae piceous, their first joints and the mouth testaceous; legs pale yellow.

Antennae longer than head and prothorax together, moderately incrassate toward apex; joint 1 longer and thickened; 2 and 3 about equally long; 4 about square; 5-10 gradually incrassate, the penultimate joints about one-half wider than long; 11 as long as 9 and 10 together, oval, pointed.

Head narrower than the prothorax, rounded, a little transverse, very finely and very sparsely punctate; eyes large, longer than the tempora; genae entirely margined.

Prothorax narrower than the elytra, about two-thirds wider than long, sides strongly rounded; base rounded, at the sides emarginate; finely and sparsely punctate, with a shallow basal fovea and two-three side bristles.

Elytra wider and about one-third longer than the prothorax, moderately densely and finely, subgranulose punctate, very finely pubescent.

Abdomen a little narrowed behind; segments 3-5 transversely impressed at base; very finely and very sparsely punctate, segments 6 and 7 smooth.

Mesosternum triangular behind, with a blunt point, reaching about one-half between the middle coxae, the latter a little separated.

Metasternum produced in front, with a blunt point, meeting the mesosternal point.

In the male the 7 dorsal segment of the abdomen with a round tubercle in the middle, nearer to the apical margin; 8 dorsal segment rounded, truncate, with a pointed tooth at each side, these teeth separated by a deep sinus from a middle lobe, the latter with rounded angles and a slight almost angular median emargination; 6 ventral segment moderately produced, rounded, narrowed at apex.

In the female the 8 dorsal segment rounded, slightly emarginate in the middle; 6 ventral segment rounded, a little narrowed.

Length, 2.8-3 mm.

Porvenir and Upper Pecos Valley, in New Mexico.

5. *Atheta (Dimetrota) lastula* spec. nov.

Moderately elongate, rather depressed, moderately broad, very little narrowed in front and behind.

Head black, with very faint bronze lustre, very little shining; prothorax and elytra brownish yellow, the latter with a faint darker cloud around the scutel and at the outer hind angles, almost opaque; abdomen reddish yellow, its apex from the 5 segment on black, the very apex sometimes a little lighter again, moderately shining; antennae piceous brown, the first two joints and the mouth a little lighter; legs yellow.

Antennae a little longer than head and prothorax together, moderately incrassate toward apex; joint 1 a little thickened; 2 and 3 about equally long, the latter sometimes a little shorter; 4 a little shorter and narrower than 5, transverse; 5-10 gradually incrassate, transverse, the penultimate joints about twice as wide as long; 11 longer than 9 and 10 together, oval, pointed.

Head a little narrower than the prothorax, rather large, transverse, moderately densely subgranulosely punctate, sparsely yellowish pubescent; eyes large, prominent, much longer than the tempora; genae entirely margined.

Prothorax a little narrower than the elytra, about one-half wider than long; sides evenly, moderately rounded; base rounded, emarginate at the sides; hind angles obtuse, not entirely rounded; densely subgranulosely punctate, with yellowish pubescence and 2-3 conspicuous black side bristles.

Elytra wider and about one-third longer than the prothorax, outer hind angles a little emarginate; very densely, not very finely punctate, with rather dense, conspicuous yellow pubescence.

Abdomen very little narrowed behind; segments 3-5 transversely impressed at base, not very sparsely and finely punctate, segments 6 and 7 a little more sparsely punctate, with sparse yellowish pubescence and robust black side bristles.

Mesosternum pointed behind, entering about three-fourths between the middle coxae, the latter a little separated.

Metasternum pointed in front, meeting the mesosternal point.

In the male the 8 dorsal segment of the abdomen truncate, with 4 equidistant teeth, the two middle ones a little broader and blunter at apex than the side teeth, the latter pointing slightly inwards; 6 ventral segment rounded, narrowed toward apex, moderately produced.

In the female the 8 dorsal segment rounded, a little narrowed toward apex, slightly truncate and slightly emarginate in the middle; 6 ventral segment rounded, narrowed, scarcely produced.

Length, 2.4-2.6 mm.

6. *Atheta (Dimetrotia) neomexicana* spec. nov.

Moderately elongate depressed and robust, very little narrowed in front and behind.

Head and prothorax black, with faint bronze lustre, moderately shining; elytra piceous brown, very little shining; abdomen black, more shining; antennae piceous, their first joints and the mouth a little lighter; legs brownish yellow.

Antennae a little longer than head and prothorax together, moderately incrassate toward apex, finely pubescent and moderately setulose; joint 1 longer, thickened; 2 scarcely longer than 3; 4 longer than wide; 5-10 gradually incrassate, the penultimate joints about twice as wide as long; 11 almost longer than 9 and 10 together, oval, pointed.

Head a little narrower than the prothorax, a little transverse, rounded, moderately densely, subgranulosely punctate, very finely pubescent; eyes large, longer than the tempora; genae entirely margined.

Prothorax narrower than the elytra, about one-half wider than long, sides evenly rounded, very little convergent in front; base rounded, at the sides emarginate; hind angles rounded; moderately densely, subgranulosely punctate; sparsely pubescent, with 2-3 side bristles.

Elytra wider and about one-third longer than the prothorax; densely subgranulosely punctate, finely pubescent.

Abdomen very little narrowed behind; segments 3-5 transversely impressed at base; very finely and sparsely punctate, segments 6 and 7 almost smooth; with black side bristles.

Mesosternum pointed behind, entering about two-thirds between the middle coxae, the latter a little separated.

Metasternal process meeting the mesosternal process.

In the male the 8 dorsal segment of the abdomen with four teeth, the two middle ones a little nearer to the side teeth than to each other, rather blunt, separated by a shallow sinus; the two side teeth a little longer, pointed, pointing inwards, separated from the middle teeth by a little deeper sinus; 6 ventral segment rounded, narrowed toward apex, a little produced.

In the female the 8 dorsal segment rounded truncate, scarcely emarginate at apex; 6 ventral segment rounded, very little produced, angularly emarginate at the middle of the apex.

Length, 2.4-2.6 mm.

Porvenir, in the Gallinas Canon, in New Mexico; in fungi.

7. *Atheta (Dimetrota) nigrita* spec. nov. •

Moderately elongate and depressed, narrowed in front and behind. Black, moderately shining; antennae and legs piceous black.

Antennae about as long as head and prothorax together, moderately incrassate toward apex, very finely pubescent and setulose; joint 2 longer than 3; 4-10 gradually incrassate toward apex, the penultimate joints about one-half wider than long; 11 about as long as 9 and 10 together, oval, pointed.

Head narrower than the prothorax, rounded, a little narrowed in front; extremely finely and sparsely punctate and pubescent; eyes rather small, shorter than the tempora; genae entirely margined.

Prothorax a little narrower than the elytra, narrowed in front, about two-thirds wider than long; sides and base rounded; posterior angles rounded; moderately densely and finely punctate, almost inconspicuously pubescent; with a round shallow basal fovea and two fine side bristles.

Elytra a little wider and about one-third longer than the prothorax; densely and subgranulose punctate, very finely pubescent.

Abdomen narrowed behind; segments 3-5 transversely impressed at base, rather sparsely and not very finely punctate, inconspicuously pubescent, with strong black side bristles.

Mesosternum with a long, not very acute point behind, entering about two-thirds between the middle coxae, the latter a little separated.

Metasternum produced in front, meeting the mesosternal point.

The 8 dorsal segment of the abdomen apparently in both sexes truncate; 6 ventral segment rounded, produced.

Length, 1.5-1.7 mm.

Sugar Pine Mills, in California, sifted along a creek.

8. *Atheta (Metaxya) subpolaris* spec. nov.

Elongate, depressed, parallel, very little narrowed in front.

Head black, moderately shining; prothorax piceous to piceous black, almost opaque; elytra brownish yellow, very little shining; abdomen piceous black, the tip lighter, shining; antennae and mouth piceous brown; legs testaceous.

Antennae longer than head and prothorax together, very little incrassate toward apex, very finely pubescent and setulose; joint 2 very little longer than 3; 4 longer than wide; 5-10 gradually very little in-



crassate, the penultimate joints a little longer than wide; 11 shorter than 9 and 10 together, oval, pointed.

Head narrower than the prothorax, about square, rounded, very sparsely and almost invisibly punctate; eyes rather small, shorter than the tempora; genae not entirely margined.

Prothorax very little narrower than the elytra, very little wider than long, sides very moderately, about evenly rounded, base rounded, slightly emarginate at the sides, hind angles rounded; moderately densely and finely punctate, with yellow pubescence with a shallow transverse basal fovea and 2 side bristles.

Elytra very little wider and longer than the prothorax, external hind angles slightly emarginate; moderately densely and finely punctate, with yellow pubescence.

Abdomen parallel; segments 3-5 transversely impressed at base; sparsely and very finely punctate; segments 6 and 7 still a little more sparsely punctate; segment 7 longer than 6; with sparse yellow pubescence.

Mesosternum very finely pointed behind, entering about two-thirds between the middle coxae, the latter almost contiguous.

Metasternum very finely pointed in front, almost meeting the mesosternal point; intercoxal isthmus short, vaguely defined.

In the male the 8 dorsal segment of the abdomen truncate, rounded; 6 ventral segment produced, its sides parallel, the apex broadly rounded truncate, very feebly emarginate, with rounded angles and with a few fine bristles on the margin.

In the female the 8 dorsal segment rounded; 6 ventral segment rounded, narrowed toward apex, scarcely produced.

Length, 3-3.3 mm.

Flagstaff, in Arizona, sifted from the detritus carried down in a storm ditch.

**9. *Ocalea (Ocalea) fusca* spec. nov.**

Moderately elongate and convex; shining, sparsely yellowish pubescent.

Head and prothorax piceous black; elytra piceous brown to piceous red; abdomen piceous black, at apex lighter; antennae piceous black; joint 1 reddish; legs reddish.

Antennae scarcely longer than head and prothorax together, feebly incrassate toward apex; joints 1-3 elongate; 4 longer than wide; 5 and 6 about square; 7-10 slightly transverse; 11 not as long as 9 and 10 together, oval, moderately pointed.

Head much narrower than the prothorax, longer than wide, rounded oval, scarcely constricted at base; moderately strongly and rather sparsely punctate; eyes moderate, about as long as the tempora; genae entirely, sharply margined.

Prothorax narrower than the elytra, a little wider than long, sides and base rounded; more narrowed in front than behind; with a shallow rounded basal impression; almost smooth, with 4 or 5 black side bristles.

Elytra about one-half longer and about one-fourth wider than the prothorax, outer hind angles emarginate; finely, rather sparsely, somewhat aciculate punctate.

Abdomen very little narrowed toward apex; segments 3-5 transversely impressed at base; finely, very sparsely punctate, with numerous marginal black hairs.

Mesosternum with a long acute process; middle coxae narrowly separated.

Length, 3 mm.

Flagstaff, in Arizona, together with *Atheta subpolaris*.

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### Concerning *Culex perturbans* at Dublin, New Hampshire.

By JOHN B. SMITH.

In the Proceedings of the Entomological Society of Washington, Vol. XI, pp. 145-149. Dr. Harrison G. Dyar writes interestingly concerning the mosquitoes at Dublin, New Hampshire, and particularly on the occurrence of *Culex* (*Mansonia*) *perturbans*. The article is not only interesting from what it contains, though there is nothing new concerning *perturbans*; but much more interesting because of its omissions, some of which I feel moved to supply to the end that the remainder of the entomological fraternity may enjoy it as much as I did. Dr. Dyar records the failure of the combined efforts of Messrs. Busck, Caudell, Howe, Stowell and himself to locate the breeding places of *perturbans* at Dublin in 1908 and prior to August, 1909. It may be added to this, that Mr. Howe came to New Jersey in 1908, received all the information we could give him and went into the field with Mr. Grossbeck, who showed him exactly where and how to find the larvæ.

Mr. Howe evidently failed to profit by the instruction sufficiently to enable him to locate the insects at Dublin, and Dr. Stowell himself came to New Brunswick in October, 1908. He also received full information and was taken into the field

and shown just how and where we found the wrigglers. Nevertheless, neither he nor, as Dr. Dyar shows, any others of those who attempted to locate the insects at Dublin, succeeded in the attempt.

Dr. Stowell in consequence became very urgent that either Mr. Grossbeck or myself should come to Dublin to help them out, because of the serious injury to the community interests, and I finally agreed that, on my return from a trip into Maine, I would stop over at Boston on Saturday, July 31st, and would run up to Dublin on the morning train, go over the ground generally, give suggestions and return on the afternoon train.

Now by a very curious coincidence, Dr. Dyar decided to break into his vacation and to visit Dublin on exactly that same day, and still more extraordinarily, his choice fell on exactly the same train that carried me. We therefore arrived at Dublin at the same time and Dr. Stowell did not seem much surprised to see Dr. Dyar; certainly not so much as I was when he came to me in the train soon after we were well away from Boston.

Almost as a matter of course Dr. Dyar joined the party of which Dr. Stowell, Mr. Howe and myself were the other members, and for three or four hours we were carried in an automobile to all the points which had been suspected as breeding places. I eliminated a number of these for reasons given; but pointed out one swamp area as an ideal spot for them and declared positively that, when properly sought for the larvæ would here be found. Another area I declared was a probable breeder, but so different from New Jersey conditions that I could not be certain without investigation. A very cursory investigation was made at one point in this area and nothing was found. I was careful to explain just how the search should be made and left Dublin after promising Dr. Stowell that I would send Mr. Grossbeck up the week following.

Dr. Dyar remained at Dublin. Next week Mr. Grossbeck reached Dublin, ready for work, and was informed that Dr. Dyar had gone out the day or so after I left, and *in the swamp that I had pointed out as an ideal breeding place* had found one

egg boat and three pupal shells. This, he was informed, constituted the sole takings and from these all the conclusions reached by Dr. Dyar were drawn. In view of these facts the following phrase in Dr. Dyar's paper becomes much more interesting. "This source is not always easy to discover. The writer made a third visit to Dublin in August, 1909, and *was able to discover an extensive breeding place of the species.*"\*

Mr. Grossbeck carried on his explorations for several days and found many egg boats as well as a full grown and recently hatched larva in the area in which Dr. Dyar had found his specimens. He also found egg boats in the electric light swamp pointed out by me as a probable breeding place, in spite of Dr. Dyar's statement that "Oviposition at present is therefore impossible here." Two other breeding places were located, one small, probably the place referred to by Dr. Dyar, and one very large and well within the range of *perturbans* flying powers. The matter is therefore not quite so simple as Dr. Dyar would have the inhabitants of Dublin believe.

Dr. Dyar credits previous work on *perturbans* development as follows: "The breeding habits of this species are peculiar. Fortunately they are now known, through the timely discovery of Mr. J. T. Brakeley, at Lahaway, New Jersey." In "Ent. News" XIX, 22, January, 1908, I published all that was then known of *perturbans*, showed that the first egg boats in nature were found by Mr. Grossbeck, and credited Mr. Brakeley with being the first to find larvæ actually attached to roots. The further work on the development of the larva was done by Mr. Grossbeck who also published, in December, 1908, "Ent. News" XIX, p. 473, the characters and habits of the pupa. Mr. Brakeley has published nothing and all the information concerning the breeding habits of *C. perturbans* comes from Mr. Grossbeck or myself.

With these few explanations and additions I trust that the scientific and practical value of Dr. Dyar's paper will be better appreciated.

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\*The italics are mine.

## Notes on Chambers' Species of *Tineina*.

BY ANNETTE F. BRAUN, Cincinnati, Ohio.

Of the innumerable species of *Tineina*, described by the late Mr. V. T. Chambers, of Covington, Kentucky, not a few are at the present time unrecognized or imperfectly known. This is due to a number of circumstances, all of which have combined to render the identification of Chambers' species difficult and have led in a number of cases to unavoidable errors. Apparently some of Chambers' types were never deposited in any institution and these often represented species of which the short description is inadequate for identification. Other species were described from specimens in such poor condition that the author himself often expressed doubts as to the correctness of his observations. A third category includes species which were named from preparatory stages alone and referred in some cases to the wrong genera. In large genera, where some species have been described from imago, others from larva or mine, the confusion can be cleared up only by the rearing of all of such species.

The writer is making an effort to rediscover by breeding and collecting those of Chambers' little known species, which were described from Ohio and Kentucky, with the intention of publishing from time to time notes which shall give additional information on life histories, correct faulty descriptions, and give complete descriptions of species known only in the larval state.

### ***Trichotaphe nonstrigella* Chambers.**

*Dasycera nonstrigella* Chambers, Bull, U S. Geol. Surv., IV, 92, 1878.

*Trichotaphe nonstrigella* Busck, Dyar's List N. A. Lep. No. 5661, 1902; Proc., U. S. Nat. Mus., XXV, 910, 1903.

This rather remarkable species, which was originally described by Mr. Chambers from a single female specimen, I have found very common locally around Cincinnati, but until a few years ago, its early stages remained entirely unknown.

During the latter half of April and the beginning of May,

the terminal leaves of the growing shoots of *Aster shortii* Hook, may be found spun together by a Gelechiid larva, which has proved to be that of *T. nonstrigella*. By the middle of May, the larvae have all pupated in a fold made by turning over the edge of a leaf.

Larva when mature about 14 mm. long. Head shining blackish; next three segments plum colored, thoracic shield blackish; segments 3 and 4 each ornamented with a pair of elongate, shining black tubercles; on dorsum at the posterior end of segment 3, a pair of grayish white spots and a similar smaller pair at the anterior end of segment 4. The remaining segments and the posterior end of segment 4 grayish white, longitudinally marked with 7 plum colored stripes, one median and three lateral, of the same width as the ground color between them; a few scattered hairs arising from small black tubercles. Legs black.

The moths begin to appear about the 20th of May, and during the latter part of May and early part of June are often exceedingly numerous in the vicinity of their food plant. Occasional scattered specimens may be found as late as the first week in July. The species is single brooded.

#### ***Ypsolophus citrifoliella* Chambers.**

*Nothris citrifoliella* Chambers, Jn. Cin. Soc. Nat. Hist., II, 184, 1880; Comstock, Rep. U. S. Dept. Agr., p. 205, 1880.

*Ypsolophus citrifoliellus* Busck, Dyar's List N. A. Lep., No. 5683, 1902; Proc. U. S. Nat. Mus., XXV, 923, 1903.

There appears to be no record of the occurrence of this species in the North, nor of any food plant other than orange.

The larvae around Cincinnati feed within the folded leaves of Prickly Ash, *Xanthoxylum americanum* Mill., a plant which botanically and in its chemical properties is closely related to the orange.

Although the Prickly Ash grows commonly near some of Chambers' old collecting grounds in Kentucky, he does not seem to have ever met with the larvae or imagoes of *Y. citrifoliellus*.

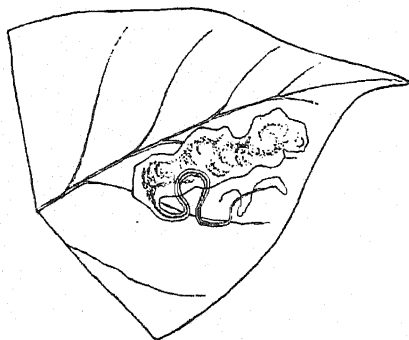
#### ***Nepticula nyssaefoliella* Chambers.**

*Nepticula nyssaefoliella* Chambers, Psyche, III, 66 1880; Dyar, List N. A. Lep., No. 6206, 1902.

Face and head tufted, reddish yellow. Antennae one-half, dark

brown above, pale ochereous beneath, eye caps shining, whitish. Thorax and forewings black with purplish reflections toward the apex of the wing. Just beyond the middle of the wing is a slightly curved pale golden fascia, which is broadest on the dorsal margin, where a few golden scales extend along the margin toward the base. Apical cilia silvery, costal and dorsal cilia tinged with purple, the latter becoming concolorous with the hind wing. Abdomen above and below, and anal tuft, purplish black. Legs pale gray with purple and metallic reflections. Expanse: 4 mm.

This is one of the numerous species of *Nepticula* named from mine or larva only. The mine which occurs quite commonly on leaves of Sour Gum, *Nyssa sylvatica* Marsh, is chiefly interesting because of its superficial resemblance in shape to that of *Antispila nyssaefoliella* Clem., from which it differs, of course, in lacking the transparency characteristic of an *Antispila* mine, and in the *abrupt* enlargement of the linear mine into a blotch.



Mine of *Nepticula nyssaefoliella* Chamb.

The mine begins as a very narrow winding linear tract, with a narrow line of frass through the center. A few days before pupation, this abruptly enlarges into an elongate, irregular pale brownish yellow blotch, 2 cm. or more in length and averaging 5 or 6 mm. in width, with the grains of frass scattered throughout its area.

The cocoon is pale greenish, somewhat oyster-shell shaped with its broader anterior edge flattened.

***Ornix inusitatumella* Chambers.**

*Ornix inusitatumella* Chambers, Can. Ent., V, 47, 1873; Dietz, Trans. Am. Ent. Soc., XXXIII, 289, 292, 1907; Dyar, List N. A. Lep., No. 6392, 1902.

Mr. Chambers' original description of this species is incorrect and was probably made from a rubbed specimen, as his type has been pronounced identical with *O. crataegifoliella* Clem. A series of bred specimens of *inusitatumella* shows that it is not even closely related to *crataegifoliella*, the most marked differences being the uniform ground color of the wings and the three entire ciliary lines.



Mine of *Ornix inusitatumella* Chamb.

Cocoon *Ornix inusitatumella* Chamb.

Palpi whitish, the tip of the second joint and a broad annulus blackish. Head grayish fuscous, with the tufts, especially behind, tinged with brown. Thorax and forewings dark brown, the latter, especially toward the base tinged with purple. Eight costal striae, of which the last seven are distinct and whitish on the costa; the eighth stria very short, the three preceding ones extended nearly to the dorsal margin; the fifth, sixth and seventh from the apex angulated in the middle of the wing and thence extending to the dorsal margin as a purple shade. Interstitial spaces conspicuously darker. Plical spots almost obsolete; the first broader but more indistinct than the second, which is a narrow black dash. Subplical space not paler than the rest of the wing. Cilia fuscous at their base, whitish beyond with three entire lines. Expanse 7.5—8 mm.



This species is a miner on the upper side of *Crataegus tomentosa* L. in Kentucky, according to Chambers, and in Ohio on *Crataegus mollis* (T. & G.) Scheele, from which I have bred it. The thin loosened upper epidermis of the almost circular blotch is yellowish white, sprinkled with frass. Later the epidermis becomes wrinkled to such an extent that the leaf is often almost folded double. At the time of pupation, the larva leaves the mine, and spins on the middle of the upper surface of the loosened epidermis a reddish yellow cocoon which is speckled with brown, exactly like the spots on the epidermis. Without very careful observation, this creates the impression that the cocoon is within the mine, as Chambers described it. The epidermis is attached to the lower surface and sides of the cocoon, this process often tearing the epidermis at each side, and the upper side of the cocoon does not project above the general level of the mine. The pupa, on emergence, does not project through the epidermis of the mine, but through the upper side of the end of the cocoon.

*O. Inusitatumella* is most nearly related to *O. prunivorella* Cham., from which it differs by its smaller size, more distinct striae and the absence of the patch of semi-erect scales on the middle of the dorsal margin.

***Marmara smilacisella* Chambers.**

*Phyllocnistis smilacisella* Chambers, Cin. Quat. Jn. Sci., II, 107, 1875; Busck, Proc. U. S. Nat. Mus., XXIII, 252, 1900; Dyar, List N. A. Lep., No. 6426, 1902.

Head and face silvery gray, except the vertex which has a few fuscous scales. Antennae shining brownish gray. Labial palpi silvery white, the apex of the second joint beneath somewhat roughened with dark brown scales, terminal joint with a dark brown annulation near the tip. Maxillary palpi dark blackish brown. Thorax dark brown. Forewings dark brown, somewhat mottled, in some lights with a deep blue iridescence. The markings which are silvery white are somewhat variable. At the basal third is a perpendicular slightly curved silvery fascia; this is, however, sometimes reduced to a white dorsal spot, reaching only to the fold. At the middle of the costa is an oblique curved white spot sometimes reaching to the middle of the wing, where its apex is opposite that of a triangular dorsal spot, situated a little farther

back; at the apical third, a triangular costal spot and opposite it, a much smaller dorsal spot; just before the apex, a small white costal spot. Apical cilia white; cilia below the apex gray with a line of dark scales through their middle, extending to the tornus. Hindwings dark brown. Abdomen dark brown, underside whitish, except near the thorax and at the bases of the segments. Legs black, with silvery annulations of varying width. Expanse: 5-5.5 mm.

This species was named by Chambers from the mine only, and erroneously referred to the genus *Thyllocnistis*. Chambers states (Cin. Quart. Jn. Sci. II, 108, 1875) that he found the mine only in Southern Kentucky on the leaves of *Smilax glabra* and never met with it in Northern Kentucky.

The three minees which produced the moths from which the above description was prepared, were found at Cincinnati, Ohio, August 31st, on the upper side of leaves of *Smilax hispida* Muhl. The mine is silvery white, narrow, even in the later stages not more than 2.5 mm. wide, with a narrow central line of frass. Its course is very winding, crossing and recrossing the earlier portion of the mine, and covering in the case of the smaller leaves almost the entire surface of the leaf.

The larva at maturity turns bright red, and leaving the mine, spins the peculiarly ornamented cocoon characteristic of the genus.

The cocoon, which is yellowish white, with a group of iridescent globules at each end, is spun in a small fold at the edge of the under side of the leaf.

The imagoes appeared September 23d and September 29th. In two of them, the fascia at the basal third is complete, in the third, it is represented only by the dorsal spot.

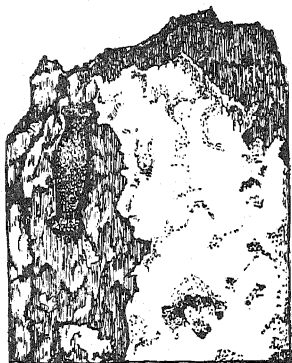
#### ***Tinea croceoverticella* Chambers.**

*Tinea croceoverticella* Chambers, Can. Ent. VIII, 106, 1876; Dietz. Trans. Am. Ent. Soc., XXXI, 54, 1905; Dyar, List N. A. Lep., No. 6500, 1902.

Several specimens of this species were bred from the flat white fungus which often covers large portions of the trunks of dead and partially burned beech.

The larva is a case-bearer and feeds externally on the fun-

gus. The case is formed of closely packed particles of frass and sawdust, and is lined with a dense sheet of grayish white silk. It is 8 or 9 mm. long, broadest in the middle, tapering



Case of *Tinea croceoverticella* Chamb.

to a narrower neck at each side of the middle, then flaring out again at the ends which are somewhat ragged.

The larva does not seem to feed upon the large white patches of fungus, where its gray case would be very conspicuous, but attacks the small patches just beginning to grow around the crevices in the bark. While feeding the case extends out horizontally; at other times it is closely appressed to the bark,

and is not easily discovered. At pupation the case is strongly attached to the bark at both anterior and posterior ends by four groups of silken threads, two at each end.

The cases were first observed on the fifth of June, and the larvae continued to feed for about a week. The imagoes appeared June 29th and July 7th; captured specimens in my collection are, however, dated a week or ten days earlier.

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THE United States Civil Service Commission announces an examination on December 15, 1909, to secure eligibles from which to make certification to fill a vacancy in the position of entomologist in the Bureau of Science, Manila, Philippine Islands. The salary of this position at present is \$1,600 per annum.

ZOPHOBAS MORIO Fabr. This species of Tenebrionidæ described by Fabricius in his *Genera Insectorum*, p. 241, 1776, should be added to the List of American Coleoptera and placed after *Upis*. Specimens bearing the label "Fla" have been for years in the collections of Dr. Horn, the American Entomological Society and Dr. Castle. According to data received from the latter this species has been collected at Key West, Fla., VIII, 28, 07, and later dates by Mr. John Hanlon in numbers under the loose saddles of the palmetto. GEO. M. GREENE.

# ENTOMOLOGICAL NEWS.

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[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

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**To Contributors.**—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

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PHILADELPHIA, PA., DECEMBER, 1909.

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We have been very much gratified at the way the increased price of the NEWS has been received by subscribers and friends. We now hope to make the NEWS even more useful to the entomological fraternity.

Along with the subscriptions at the increased rate we are getting comments like the following:

Heartily approve your advance in price to keep up the efficiency of the NEWS. Wonder how you managed so long on a dollar.

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It is a credit to those who have made it what it is and invaluable to those interested in entomology.

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It is in my estimation the best journal devoted to entomology published in America.

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MARY E. MURTFELDT.

The NEWS starts out with two fine big numbers. It now has no peer among entomological journals.

H. C. FALL.

Enclosed you will find two dollars, which kindly apply to the expense of issuing the NEWS for 1910. Long may she wave. Having advised you to do this some years ago I am glad to see you make the experiment.

F. A. MERRICK.

It is very likely that we will continue the resumé of the literature of entomology that was so much appreciated in former years.

It will be noticed that subscription blanks are placed in each copy of this issue. Those who have paid will either disregard the slip or send it to a friend interested in entomology.

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## Notes and News.

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

CHANGE OF NAME.—In the Science Bul. Bklyn. Inst. Mus. vol. I, p. 379, I described *Monocrepidius texanus*. As *texanus* is preoccupied I propose *Monocrepidius similis* for the species. CHARLES SCHAEFFER.

BRITISH INSECTS IN CANADA. I have recently received from Cape Race, Newfoundland, a Daddy-long-legs, *Tipula oleracea*, female, two blackish Red Admiral Butterflies, *Vanessa atalanta*; a Green Veined White, *Pieris napi*, with the veins blackish; a blackish water beetle, *Dytiscus marginalis* and a timber longhorn, *Callidum violaceum*, all typical British species; but I was surprised to see enclosed with them a Milk Weed Butterfly, *Anosia plexippus*, which I had no idea migrated so far North and an American Painted Lady, *Pyramis huntera*. Previously I received from the banks of the Saint Laurence, captured at

Clarke City, a Camberwell Beauty, *Vanessa antiopa*; a small dragon fly, *Agrion cyathigerum*, and a geometrical moth, *Cidaria immanata*, all typical British. It would be interesting to know which of these insects are the old inhabitants of the subpolar regions and which have been introduced by commerce; the water beetle is also found in Greenland. I have over and above an apterous Oil Beetle, *Meloe cordillerae*, purporting to come from South America, which is so like its British cousins that one is tempted to ask how long it took to walk on its heteromerus legs to Chile.

As regards *Pieris napi*, an English entomologist would recognize it as such. I have Mr. W. G. Wright's Butterflies of the West Coast at hand and most of the species on Plate VI we over here would call seasonal or local forms of *napi*, which varies the same and to a greater extent in the British Islands, I do not quite recognize his *bryoniae*, but I suppose he has identified it with the Swiss mountain form, it most resembles the specimen I have from Cape Race and may be the subpolar, ancestral form; the other species on Plate VI seem to be *P. napi* and what I imagine to be hybrids between *napi* and *rapi*, we have them also in Britain. A. H. SWINTON, Totnes, Devonshire, England.

THE meetings in Boston promise to be very interesting and a large attendance is expected.

NOTES on the Occurrence of Some Butterflies rare in Massachusetts and Maine.

I. *Junonia coenia*.—On August 12th, 1909, I captured two specimens of this insect at Isle au Haut, Maine, (an island twenty miles to the eastward of Rockland). They were both hovering around a small puddle, surrounded by milkweed on a path leading up the one mountain of the island, and were decidedly darker in color than those that I have seen taken in the Southern States. I find that Mr. W. C. Wood reports on page 386 of the NEWS for October 1908, that he saw a specimen at York, Maine, and that this was also decidedly darker than the Southern specimens. I do not know of this species having been taken as far North as this before.

II. *Euptoieta claudia*.—I captured one of this species in August 1901, at Wareham, Mass., but have never seen a sign of one so far North as that until September 11th, 1909, when I saw, close by, but was unable to capture one at Gerrish Island, not far from Kittery, Maine.

III. *Catopsila eubule*.—I have seen various records of this insect being taken in Massachusetts, but I have never seen an account of them being plentiful. In a small garden on the Island of Chappaquidick, to the eastward of Martha's Vineyard, on September 21st, 1909. I was greatly surprised to see several large yellow flies darting here

and there among the flowers, and after sometime, succeeded in capturing one, without a net, which proved to be *C. eubule*. I saw as many as twelve more hovering hither and thither among the flowers for over half an hour, at the end of which time I went sailing; but curiously there was no sign of a single one of these insects on the two following days; where they came from and went to is a mystery.

IV. *Limenitis arthemis*.—During the past summer I have seen as many as five of these insects in Milton, Mass., but have not seen even one there before in the past twelve summers. I also saw eight of this species on Mount Desert Island, Maine, during August, where I have seen only one before during the past ten years in August. It seems possible that this insect may be migrating towards the coast and to the southward.—GEORGE R. MINOT, 188 Marlborough St., Boston, Mass.

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### BOOKS RECEIVED.

OUTLINES OF ENTOMOLOGY. Part one, Anatomy and Physiology, by Oscar W. Oestlund. The H. W. Wilson Company, Minneapolis. Forty-four pages.

BARKBEETLES OF THE GENUS *DENDROCTONUS* by A. D. Hopkins, Ph.D. Bureau Ent. Bull. 83, part I, 169 pages. A very valuable contribution.

REPORT of the Entomological Department of the New Jersey Agricultural Exper. Station for the year 1908. By John B. Smith, Sc.D. 428 pages.

INSECTS Injurious to shade trees. By John B. Smith, Sc.D. State Entomologist of New Jersey. Two plates in color.

THE Green Bug and its Natural Enemies. Bulletin of the University of Kansas, Vol. IX, No. 12. By S. J. Hunter, Professor of Entomology, Univ. Kansas, 221 pages. An important publication.

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### A Dream.

After an evening spent with a "List of the Specimens of British Animals in the Collection of the British Museum. Part V. Lepidoptera. By J. F. Stephens.

The *Scotophila tragopogonis* creeps out of the *Lasiommata aegeria*, in the *Xylocampa lithoriza* of dawn;

And the *Hipparchia semele* leaps in the *Emmelesia rivulata*, and splashes the *Odoptera fuscautaria*.

In the vault of the *Polyommatus aegon*, drifts a *Xylina conspicularis* so wet,

That each dew-crowned *Phibalapteryx tersata* is soon bedecked with a  
*Dianthecia albimacula*.  
'Neath an old *Boarmia punctularia*, like a russet *Hepialus humuli*,  
a *Eupithecia venosata* sighs  
And a *Cerura furcula* plays in the *Hipparchia janira*  
Where the *Mamestra suasa* violet lies.  
Oh, sweeter far is the *Ephyra punctaria* than the *Thyatira batis*'s dainty  
hue,  
And her fresh *Psyche fusca* is quite in tone with the morning's  
*Polyommatus argiolus*.  
No *Cynthia cardui* with jeweled crown though it be of *Geometra*  
*papilionaria* made,  
Can vie with the *Venessa antiopa* here in this *Ceratopacha fluctuosa*  
glade.  
But the *Hipparchia tithonus* wakes in his nook by the *Lasiommata*  
*megaera*  
And stamps on the *Graphiphora brunnea*,  
While a *Macroglossa stellatorum* clad in his *Plusia chrysites* darts  
forth from the *Acronycta salicis* gray.  
The *Clisiocampa neustria* throws open the window wide where the  
*Odonestis potatoria* yawns o'er his beer  
When an *Atolmis rubricollis* struts about—And I'm glad that the day  
is here.

## KEY.

The "Mouse" creeps out of the "Speckled Wood" in the "Early Gray"  
of dawn,  
And the "Grayling" leaps in the "Rivulet" and splashes the "Dusky  
Thorn"  
In the vault of the "Silver Studded Blue", drifts a "Silver Cloud" so  
wet,  
That each dew swept "Fern" is soon bedecked with a "Beautiful Coronet."  
'Neath an old "Gray Birch" like a russet "Ghost," a "Pretty Widow"  
sighs;  
And a "Kitten" plays in the "Meadow Brown" where the "Dog's  
Tooth" violet lies.  
Oh, sweeter far is the "Maiden's Blush" than the "Peach Blossom's"  
dainty hue,  
And her fresh "Brown Muslin" is quite in tone with the morning's  
"Azure Blue."  
No "Painted Lady" with jeweled crown though it be of "Large Emerald"  
made  
Can vie with the "Camberwell Beauty" here in this "Satin Carpet" glade.



But the "Gate Keeper" wakes in his nook by the "Wall" and stamps  
on the "Purple Clay"  
While a "Humming bird" clad in his "Burnished Brass" darts forth  
from the "Willow" gray.  
The "Lackey" throws open the window wide where the "Drinker"  
yawns o'er his beer.  
Then a "Red Necked Footman" struts about—And I'm glad that day  
is here.

G. W. J. ANGELL.

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## Doings of Societies.

A meeting of the American Entomological Society was held April 22, 1909. In the absence of the President and Vice-President, Dr. Castle was asked to preside. Members present Castle, Laurent, Skinner, Liebeck, Associates of the Entomological Section, Ilg, Viereck, Matthews, Haimbach, Daecke, Cole, Kelley, Greene, Rehn. The minutes of the last meeting were read and approved.

Mr. Ilg exhibited a moth *Feralia jocosa*, taken on the Wissahickon.

Mr. Matthews exhibited some species of *Hepialus* and other rare and beautiful moths from Queensland, Australia.

Mr. Laurent said that not unfrequently he had had Chinese specimens sent to him mounted on needles.

Mr. Viereck spoke of the advantages of Washington as an entomological center.

Mr. Daecke spoke on collecting experiences around Harrisburg and described the geography of the nearby mountains.

Dr. Skinner exhibited and described the new drawer case for the Brock tins. These are intended for large insects.

Mr. Rehn made some remarks on the Orthoptera portion of Smith's new list of New Jersey insects. The speaker had submitted a large number of notes to Prof. Smith and included twenty-eight species additional to those treated in Smith's 1889 list, a number in the old list being considered too doubtful for inclusion.

The different physiographic and faunistic regions of south-

ern New Jersey, as recently laid out by Mr. Stone were also discussed and the distribution of certain of the families in that portion of the State commented upon. The data or distribution was said to be remarkably complete for certain species.

HENRY SKINNER, *Secretary*.

A meeting of the American Entomological Society was held October 28, 1909. In the absence of the President and Vice-President, Dr. Castle occupied the chair. Fourteen persons were present including Prof. F. M. Webster, of Washington, D. C.

Prof. Webster said this was the first meeting of the Society he had attended. He spoke of the enormous growth of the study of entomology and the increased number of people engaged in the work and contrasted the present with days of the pioneers. He referred to the skin eruption in the West produced from threshing straw and due to the mite *Pediculoides ventricosus*, particularly where the joint worm is common. Cases have been reported where the disease had been contracted from straw mattresses. This disease is caused by a mite, its natural food being the larva of the Angoumois grain moth, the mite being predaceous. It is an external parasite on insects.

Mr. Rehn made some remarks on a trip made during the past summer in company with Mr. Hebard in the western states collecting Orthoptera. The territory covered was very extensive and over ten thousand Orthoptera were collected. A number of the localities visited were in regions unknown Orthopterologically and much valuable information on the food plants and habits of a number of species was secured in addition to the specimens collected. Many rarities and a number of new species were secured.

Dr. Skinner exhibited a *Chionobas* from Colorado supposed to be a new species, an aberration of *Melitaea mylitta* and *Alcathoe korites* from New Mexico. The latter two taken by Mr. John Woodgate at Fort Wingate.

HENRY SKINNER, *Secretary*.

At a regular meeting of the Feldman Collecting Social, held September 15, 1909, at 1523 S. 13th Street, Philadelphia, thirteen members were present. President Harbeck in the chair.

A letter was read from Mr. J. A. Grossbeck, Secretary of the Newark Entomological Society, inviting the Feldman to the celebration of the 25th anniversary of that Society. The Secretary was instructed to answer this, thanking them for same.

Mr. Wenzel said that at the present time the marshes in "the Neck" are perfectly dry and that *Cicadas* are very numerous. They settle on the end of the reeds where they "sing their little song."

Prof. Smith said in New Brunswick after the Pennsylvania Railroad had elevated the tracks through that place and had brought sand for the embankments from outlying districts the large wasp *Sphecius speciosus* Dru. bred there and has almost exterminated the *Cicadas*, and that there were hundreds of them before the *Cicadas* appeared. Mr. Davis, instead of collecting *Cicadas* finds a colony of these wasps and there waits and takes the *Cicadas* as the wasps bring them in. Mr. Harbeck said he had the wasps sent to him from the Perkiomen where there is a colony of them.

Mr. Wenzel read an interesting, humorous, clipping on the wasp *Euменes*, taken from an advertising newspaper.

Prof. Smith exhibited a large ♀ carpenter ant *Camponotus* and a half grown Pentatomid. At first sight he thought it was the ant with her prey, but on closer inspection he saw that the Hemipteron had its beak in the abdomen of the ant and was allowing itself to be dragged along, sucking away all the time until the specimens were picked up.

Mr. Wenzel exhibited a *Mantispa brunnea* Say collected by him at Da Costa, N. J., July 4, 1909.

Mr. Daecke exhibited leaves and fruit of paw paw from Harrisburg, also *Tortrix fumifera* Clem. July 21, 1909, at light in untold numbers and said it had been reported from the neighboring districts as common (Dr. Skinner said it was common here at the same time). A pupa shell of a micro in paw

paw and *Pyrausta laticlavia* G. and R. bred from horse mint (*Monarda punctata* L.) the larva collected at Delair, N. J., August 22, 1909, and bred September 6, 1909. The larva is the same color as the adult. *Pomphopoea sayi* Lec from Factoryville, June 19th and June 20th where they destroyed the roses, white and yellow, but did not touch the red ones; Friendsville, June 26th with the same complaint and Birchardville, June 29th said that *Lema sexpunctata* Oliv. was very common in a small space at Conewago, Pa., August 14, 1909, and other days on Virginia Day Flower (*Commelina virginica* L.) having taken 114 in one day. This seems to be the northern limit of the species, as those in the Academy and Horn collections are from Georgia and Texas. Exhibited a specimen of the plant showing the damage done by the insect.

Mr. Harbeck exhibited specimens of *Ictericaria seriata* Loew and *I. circinata* Loew and stated that they were fairly common on marshy ground in a space about thirty feet square at Broad Street Park, Trenton, N. J.

Mr. Wenzel described how he had examined the maritime plants at the shore for Coleoptera and found many flea beetles.

Mr. Kaeber exhibited a series of Queen's instruments, such as are used on a North Pole expedition.

Dr. Skinner said he had a moon vine on his place at Ardmore, Pa., and he had noticed *Polistes* on the buds in the morning and on the same flowers when he came home at night, and as far as he knew they were there all day and remained immovable for over a month. Others appeared and did the same, but disappeared when the flowers opened. Same speaker said Peary had found bees within 500 miles of the Pole.

Adjourned to the annex.

GEO. M. GREENE, *Secretary*.

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A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 27th, 1909. Mr. H. W. Wenzel, Vice Director, presided. Eight persons were present. Dr. F. E. Blaisdell, of San Francisco, and Mr. M. Reyher, of Philadelphia, visitors.

Dr. Blaisdell said it gave him great pleasure to be present in the East and attend a meeting here. The Pacific Coast Entomological Society has created an additional interest in Entomology in that part of the country. In his own specialty, Coleoptera, he had been particularly interested in the Tenebrionidae and had been working in conjunction with his friend, Dr. Van Dyke. In the Eleodiini he believed he could find characters to separate the species and had found his surmise correct. The primary genital characters proved a great aid and the preparation of these and the methods of study were described in detail. The nomenclature of the parts was meagre and names had to be given. The anatomy of these insects was described and illustrated.

Mr. Wenzel said Dr. Blaisdell was to be congratulated on the painstaking and valuable work he had done in this very difficult group.

Mr. Rehn exhibited some specimens of Orthoptera collected by Mr. Hebard and himself in the summer of 1907 in Western Texas and New Mexico. The speaker called attention to the extensive range of certain species exhibited, notably *Parophomala calamus* and *Auconia caeruleipennis*. As an illustration of the occasional restriction of a species to river valleys the case of *Diapheromera persimilis* in the Rio Grande valley was mentioned. Mr. Morgan Hebard was elected a member and Mr. C. T. Greene and Mr. J. E. Stanyon were elected associates.

HENRY SKINNER, *Recorder*.

A meeting of the Entomological Sections was held September 23, 1909. In the absence of the Director and Vice-Director, Dr. D. M. Castle occupied the chair. Nine persons were present.

Dr. Skinner exhibited Pennsylvania specimens of *Thecla patersoni*, taken by Mr. F. M. Jones, also an aberrant *cecropia* from Bristol, Pa., the real color being largely replaced by yellow. Mr. Herman Hornig mentioned a recent trip into the mountains near Harrisburg, where he took *Papilio ajax*.

HENRY SKINNER, *Recorder*.





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